California State University, San Bernardino CSUSB ScholarWorks

Theses Digitization Project

John M. Pfau Library

2001

Bookmark search: A web-based bookmark search engine

Yun Sang Lee

Follow this and additional works at: https://scholarworks.lib.csusb.edu/etd-project

Part of the Databases and Information Systems Commons

Recommended Citation

Lee, Yun Sang, "Bookmark search: A web-based bookmark search engine" (2001). *Theses Digitization Project*. 4331.

https://scholarworks.lib.csusb.edu/etd-project/4331

This Project is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.

BOOKMARK SEARCH: A WEB-BASED BOOKMARK SEARCH ENGINE

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Computer Science

by

Yun Sang Lee

June 2001

BOOKMARK SEARCH: A WEB-BASED BOOKMARK SEARCH ENGINE

A Project

Presented to the

Faculty of

California State University,

San Bernardino

by

Yun Sang Lee

June 2001

Approved by:

Dr. George M. Georgiou, Professor, Computer Science

Computer Science Dr. Owen Murphy, ssor, Pro

Dr. Josephine G. Mendoza, Pyofessor, Computer Science

Date

TABLE OF CONTENTS

.

.

•

.

.

ABSTRACT
LIST OF TABLESviii
LIST OF FIGURES
CHAPTER ONE: SOFTWARE REQUIREMENT SPECIFICATION
1.1 Introduction 1
1.2 Product Overview and Summary 3
1.2.1 Perspective of Administrator 3
1.2.2 Perspective of User 4
1.3 Technologies 5
1.3.1 Hypertext Preprocessor 5
1.3.2 Server-Side Processing 6
1.4 Development, Operating, and Maintenance Environments
1.4.1 Development Environment 7
1.4.2 Operating Environment 8
1.4.3 Maintenance Environment 8
1.5 Graphical User Interface (GUI) 8
1.5.1 General Layout 9
1.5.2 Home
1.5.3 Search
1.5.4 Search Box
1.5.5 Search Field

ABSTRACT

1405

The BOOKMARK-SEARCH is a Web-based software application that provides user tools to upload the Netscape's bookmarks or Internet Explorer's favorites and find desired information over the Internet. The purpose of this software is to provide a search engine that allows users to search by keyword user's own bookmarks or favorites.

The BOOKMARK-SEARCH also provides bookmark management system. It allows quickly edit, delete and search through users' bookmarks and favorites. It helps users to access bookmarks from anywhere in the world easily.

The BOOKMARK-SEARCH system was implemented in PHP (PHP Hypertext Preprocessor), MySQL database and Apache Web Server on Linux system. PHP is a new and efficient serverside application development API, the BOOKMARK-SEARCH software provides cross-platform and extensibility for further development.

Using BOOKMARK-SEARCH, users can easily find more valuable information than regular search engine on the Web. BOOKMARK-SEARCH does not require any software installation on user's local machine or programming skills to use it.

iii

1.5.6 Search Method	14.
1.5.7 Search Match Position	14
1.5.8 Search Sort	15
1.5.9 Search Result	15
1.5.10 Related Bookmarks	16
1.5.11 Upload	17
1.5.12 Add a New Bookmark	18
1.5.13 Add a New Bookmark Result	19
1.5.14 Bookmarks File Upload	20
1.5.15 Bookmarks File Browsing	21
1.5.16 Internet Explorer's Favorites Export	22
1.5.17 Export Result	23
1.5.18 Bookmarks File Upload Result	23
1.5.19 Bookmarks Edit	24
1.5.20 Bookmarks Edit Menu	25
1.5.21 Bookmarks Update Site	26
1.5.22 Bookmarks Update Box	27
1.5.23 Bookmarks Update Result	28
1.5.24 Bookmarks Delete Site	29
1.5.25 Bookmarks Delete Result	30
1.5.26 Search User's Bookmarks	31
1.5.27 Browse Category	32

	1.5.28	Browse	Bookma	arks	Li	st		•	•	•	-	•	•	•	33
	1.5.29	Help		•••	•		•	•	•	•	•	•	•	•	34
	1.5.30	Validat	lion		•		· -	•	•	•	•	•	-		35
	1.5.31	Adminis	strator	r Vi	∋w		-	•	•	•	•	·	•	•	36
	1.5.32	View a Adminis	-		in	• •	· -		•	•	•	•	•	•	36
	1.5.33	Delete	in Adm	nini:	str	ato	or		•	•	•	•	•	•	37
1.6	Functio	nal Requ	uiremer	nts		• •	•	•	•	•	•	•	•	•	38
	1.6.1	Overall	Schema	a	•	• •	•	•	•	•	•	•	٠	•	39
	1.6.2	State D:	lagram	•	•	• •		•	•	•	•	•	•	•	40
	1.6.3	Bookmarl	c-Searc	ch A	lgo	rit	.hm		•	•,	•	•	•	•	41
	1.6.4	Director	ry Stru	ıctu:	re			•	•	•	•	•	•	•	42
	1.6.5	Databas	e Desig	gn											
	1.	6.5.1 (Concept	cual	Мо	đe]	L D:	iag	gra	ım		•	•	•	43
	1.	6.5.2	Entity	Rela	ati	ons	shij	ρI	Dia	ıgı	ran	n	•	•	44
	1.	6.5.3	Logical	l Moo	del	Τa	abl	e S	Scł	ıen	na		•	•	45
	1.	6.5.4	SQL Cor	man	ds		•••	•	•	•	•	•	•	•	47
1.7	Perform	ance Re	quireme	ents		•		•	•	•	•	•	•	•	48
	1.7.1	Reliabi	lity		٠	•		•	•	•	•	-	•	٩	48
	1.7.2	Efficie	ncy		•	•	• •	•	•	•	•	•	•	•	48
	1.7.3	Testabi	lity	• •	•	•		•	•	•	-	•	•	•	48
1.8	Excepti	on Hand	ling		•	•	•••	•	•		•	•		•	49
1.9	Conclus	sion .			•	•			•	-	•	•		•	49

÷

1.10 Proposed Future Development	50
1.11 Acceptance Criteria	51
1.11.1 Test Acceptance Criteria 5	51
1.11.2 Unit Testing	51
1.11.3 Integration Testing	52
1.11.4 System Testing 5	53
1.12 Glossary of Terms	54
CHAPTER TWO: DETAILED DESIGN	56
REFERENCES CITED	72

LIST OF TABLES

,

-

Table 1.	User Inputs and Corresponding Actions for User Main Menu
Table 2.	User Inputs and Corresponding Actions for User Sub Menu 11
Table 3.	Database Table: User 45
Table 4.	Database Table: Bookmark
Table 5.	Database Table: Category 47
Table 6.	Unit Testing
Table 7.	Integration Testing
Table 8.	System Testing

LIST OF FIGURES

Figure	1.	Menu	9
Figure	2.	Home	2
Figure	3.	Search	3
Figure	4.	Search Box	3
Figure	5.	Search Field	4
Figure	6.	Search Method	4
Figure	7.	Search Match Position	5
Figure	8.	Search Sort	5
Figure	9.	Search Result	6
Figure	10.	Related Bookmarks 1	7
Figure	11.	Upload	8
Figure	12.	Add a New Bookmark	9
Figure	13.	Add a New Bookmark Result	0
Figure	14.	Bookmarks File Upload	1
Figure	15.	Bookmarks File Browsing	2
Figure	16.	Internet Explorer's Favorites Export	2
Figure	17.	Export Result	3
Figure	18.	Bookmarks File Upload Result 24	4
Figure	19.	Bookmarks Edit	5
Figure	20.	Bookmarks Edit Menu	6
Figure	21.	Bookmarks Update Site	7

Figure 22.	Bookmarks Update Box	28
Figure 23.	Bookmarks Update Result	29
Figure 24.	Bookmarks Delete Site	30
Figure 25.	Bookmarks Delete Result	31
Figure 26.	Search User's Bookmarks	32
Figure 27.	Browse Category	33
Figure 28.	Browse Bookmarks List	34
Figure 29.	Help	35
Figure 30.	Validation	35
Figure 31.	Administrator View	36
Figure 32.	View and Update in Administrator	37
Figure 33.	Delete in Administrator	38
Figure 34.	Overall Schema	39
Figure 35.	Bookmark-Search State Diagram	40
Figure 36.	Bookmark-Search Algorithm	41
Figure 37.	Directory Structure	42
Figure 38.	Conceptual Model Diagram	43
Figure 39.	Entity Relationship Diagram	44

.

CHAPTER ONE

SOFTWARE REQUIREMENT SPECIFICATION

1.1 Introduction

Internet search engines are very important to users looking for information on the Internet. They provide users convenient access to their desired information. They have large databases of links. However, they often provide too many responses that are difficult to wade through.

Bookmarks are pointers to web sites on the Internet with which users mark a site that they may visit in the future, with the simple click of a mouse. When a person visits a worthwhile web site, he or she would like to remember it for the next visit and save the URL in Netscape's BOOKMARK or in Internet Explorer's FAVORITES. The bookmarks file is saved on the users' local computer. Bookmarks represent in general high quality web links the choice of which was done with significant investment from the users.

The proposed BOOKMARK-SEARCH is a search engine, an online server side program, where users can upload their bookmarks browsing local machine to specify bookmarks file and access them collectively through a search engine. It

provides multi search field such as category and bookmarks. It also provides bookmarks management system for users who upload their bookmarks file. BOOKMARK-SEARCH keep tracks how many same URLs are in the database when users upload and delete bookmarks. The numbers are listed with search results as a score that implies importance. Obviously, BOOKMARK-SEARCH provides more valuable information than regular search engines, since it performs a search on bookmarks provided by many users. BOOKMARK-SEARCH combines both the power of the search engine and the selectivity of bookmarks.

BOOKMARK-SEARCH stores all users' bookmarks together and provides the search engine that will find relevant information as a response to a query. User saves only valuable links for them, which in all likely will be valuable to others as well.

BOOKMARK-SEARCH uses a bookmarks file upload function to get the bookmarks information while regular search engines use Robot which is a program that automatically traverses the Web's hypertext structure by retrieving a document, and recursively retrieving all documents that are referenced to gather new site information and update their database [3].

1.2 Product Overview and Summary

The software product BOOKMARK-SEARCH is designed to provide a Web-based bookmarks search engine that allows users to retrieve valuable links on the Internet in a simple way. BOOKMARK-SEARCH provides an online bookmarks search engine based on data provided by users through the user-friendly GUI (Graphical User Interface) of Internet browsers.

The objective of the project is to create a search engine in which the databases of links are the bookmarks uploaded by the users.

The main idea of the BOOKMARK-SEARCH system is the sharing of bookmarks resources required carrying on Internet search. It aims to provide an affordable search solution to users while sharing bookmarks resources.

BOOKMARK-SEARCH is written in PHP, JavaScript, HTML with MySQL database, and Apache Web server on Linux system. 1.2.1 Perspective of Administrator

The prospective BOOKMARK-SEARCH administrator can build online search engine site adding new links and uploading each user's Netscape's BOOKMARK or Internet Explorer's FAVORITES. The administrator can modify uploaded information using provided tools.

1.2.2 Perspective of User

When a user visits the Web site of BOOKMARK-SEARCH, it provides two options to upload the user's bookmarks files. When a user clicks the "Upload" in the main menu bar, BOOKMARK-SEARCH provides two sub menus "Add a bookmark" and "Upload bookmarks file". If a user chooses the "Add a bookmark", it provides empty input boxes that allow the user to enter a single bookmark's information directly. After the user fills out the user-input form, the user submits it to upload the data. If the user would like to upload the user's bookmarks file, the user can select "Upload bookmarks file" menu. The format of Netscape's BOOKMARK is a single HTML file while Internet Explorer's FAVORITES are group of link icons. BOOKMARK-SEARCH only can parse Netscape's BOOKMARK format and provides format conversion function. When the user selects upload menu with Internet Explorer, a window prompt pops up and asks if the user wants to export FAVORITES to BOOKMARK file. If a user clicks "yes" button, user can upload it after specify file with user's email address and code. If a user uses the Netscape browser, it will provide a browsing button directly and user can find his/her BOOKMARK file. After

choosing the file, the user submits upload button with user's email address and code.

Once the user uploads the desired bookmarks, he/she simply edits it to submit own email address and code in Edit Site page. The BOOKMARK-SEARCH allows any user to search valuable data from all uploaded bookmarks and favorites database. BOOKMARK-SEARCH provides several options such as sort, keywords matching position and keywords grouping method. It also provides multi search fields, so users can retrieve category name as well as bookmarks information. After the user searches from a category, BOOKMARK-SEARCH provides a link that lists bookmarks in the category.

1.3 Technologies

1.3.1 Hypertext Preprocessor

PHP (recursive acronym for PHP: Hypertext Preprocessor) is an open-source server-side scripting language for creating dynamic Web pages for e-commerce and other Web applications [1]. A dynamic Web page is a page that interacts with the user, so that each user visiting the page sees customized information.

PHP offers a simple and universal solution for easyto-program dynamic Web pages. The intuitive interface allows programmers to embed PHP commands right in the HTML page. PHP's syntax is similar to that of C++ and Perl, making it easy to learn for anyone with basic programming skills. Its elegant design makes PHP significantly easier to maintain and update than comparable scripts in other languages.

Unlike other scripting languages for Web page development, PHP offers excellent connectivity to most of the common databases (including Oracle, Sybase, MySQL, ODBC and many others). PHP also offers integration with various external libraries, which allow the developer to do anything from generating PDF documents to parsing XML (Extensible Markup Language).

Perhaps the greatest advantage of PHP, when compared to other scripting languages such as ASP or ColdFusion, is that it is open-source and cross-platform, suitable for today's heterogeneous network environments [1].

1.3.2 Server-Side Processing

Server-side processing and generation of web pages offer several advantages over client-side-only technologies. First of all it minimizes network traffic by

limiting the need for the browser and server to talk back and forth to each other. The second advantage is it makes for quicker loading time since, in the end, we are only actually downloading a page of HTML. The third one is it avoid the browser-compatibility problems and can provide the client with data that do not reside at the client. It also provides improved security measures, since things can be coded that they can never be viewed from the browser.

1.4 Development, Operating, and Maintenance Environments

1.4.1 Development Environment

BOOKMARK-SEARCH uses the following hardware and software on the server. Users can use a standard Web browser such as Netscape Navigator or Internet Explorer to access it.

1. Hardware: IBM Compatible System (Personal Computer)

- a. 200 Mhz Pentium
- b. 4 GB hard disk
- c. 64 MB RAM
- d. 3 ½" floppy disk drive
- e. 8x IDE CD-ROM drive
- f. 17" SVGA monitor

- g. 104 standard keyboard
- h. MS compatible mouse

2. Software:

- a. Redhat Linux 7.0/ Kernel v2.2.16-22
- b. Apache Web Server 1.3.14-3
- c. PHP 4 engine
- d. MySQL database 3.23.31

3. Languages:

- a.PHP 4
- b. JavaScript
- c. HTML

1.4.2 Operating Environment

The product shall operate within the environment as specified above in section 1.4.1

1.4.3 Maintenance Environment

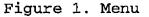
The product shall be maintained within the environment as specified above in section 1.4.1

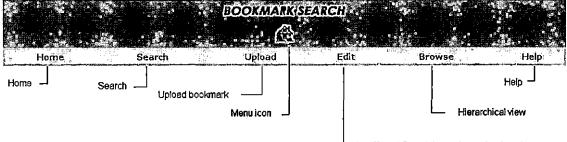
1.5 Graphical User Interface (GUI)

BOOKMARK-SEARCH GUI offers an easy way to upload Netscape's BOOKMARK and Internet Explorer's FAVORITES. It also provides a search tool in all uploaded bookmarks, a search tool in user's own bookmarks, folder view, update and delete bookmarks tools. This section describes each of the GUI that Bookmark-Search provides.

1.5.1 General Layout

BOOKMARK-SEARCH has the main menu navigation bar that is displayed at the top of each window to enable a user to navigate the BOOKMARK-SEARCH by a simple click of a tool button (Figure 1).





- Modify and Search in user's own bookmark

The menu consists of six categories and fourteen site links. The tool buttons allows a browser to move on to the other BOOKMARK-SEARCH utilities of interest. The each button provides links the BOOKMARK-SEARCH user to access it.

The main menu for the user, which includes "Home", "Search", "Upload", "Edit", "Browse" and "Help" that can be found in every window as needed. The icon displays the current selected menu. The search will run on the database

and display related information. Bookmark search is done through the SQL query. Table 1 and Table 2 summarize the effects of the various user inputs.

In addition to the main menus, each page of BOOKMARK-SEARCH contains hyperlinks of other utilities that a user can access. The description of these utilities is found in the following sections.

User Input	Result				
Click the Home link	Display home page				
Click the Search link	Display search page				
Click the Upload link	Display upload page				
Click the Edit link	Display edit page				
Click the Browse link	Display bookmarks in BOOKMARK-SEARCH				
Click the Help link	Display help menu for BOOKMARK-SEARCH				

Table 1. User Inputs and Corresponding Actions for User Main Menu

Table 2. User Inputs and Corresponding Actions for User Sub Menu

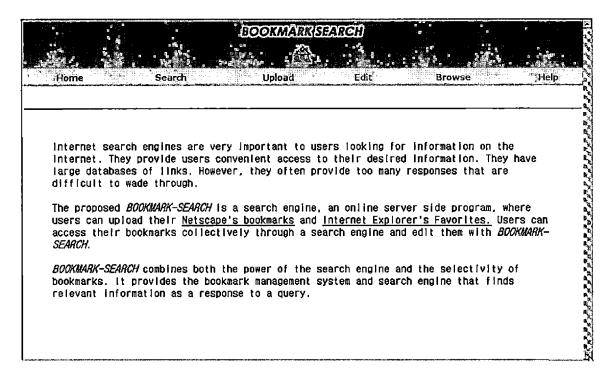
User Input	Result				
Click the search icon	Display search result				
Click the related search icon	Display related search result				
Click the add icon	Add new site into the MySQL database				
Click the browse bookmarks file button	Display browsing window				
Click the favorites export button	Convert favorites to a bookmarks file				
Click the upload icon	Upload specified file up to server				
Click the site modify icon	Display editable input box				
Click the site delete icon	Delete bookmarks from MySQL database				
Click the search in user's bookmarks icon	Display search result				
Click the site update icon	Update site information in MySQL database				

1.5.2 Home

Home explains the purpose of the BOOKMARK-SEARCH system and gives the user a summary of how it works (Figure 2).

.

Figure 2. Home



1.5.3 Search

Search is a tool of the BOOKMARK-SEARCH system, which allows users to find a desired links with the search box in the whole uploaded bookmarks. This page also provides search conditions such as search area, method, keyword match position and sort option for user (Figure 3).

Figure 3. Search

с	° ≦	3" 2	BOOKMAL	RKISEARCH		· · ·	
				Š.			
Home		Search	Upload	Edit	Brows	e	Help
				· · · · · · · · · · · · · · · · · · ·			\$
	Туре кеуж	ords, select	search field with sea	arch conditions and t	hen click search	button	16 10 10
	Keyword	s:			🛠 search		19 10 10
	Search Fi	eld: Bookmark	Method: all(AND)	Match position: [ar	Sort by: 🖪	C079 🔭	5
							1 1 2
							1 1 1
) 8 8
							2 2 4
							r.
							ឆ្នែ # ស្ត្រី រ
							R.
		un etterari enere teas or ottatal	talihin una manamana (dalihi bilihi talihati		1) Maria Maria Calendra de Constante de Calendra de Calendra de Calendra de Calendra de Calendra de Calendra de		3

1.5.4 Search Box

It consists of a search keyword box and four search conditions (Figure 4).

Figure 4. Search Box

 Keywords:
 IInux search

 Search Field:
 Bookmark ()

 Method:
 all(AND) ()

 Match position:
 any ()

 South by:
 score ()

1.5.5 Search Field

Search area consists of two fields. If user chooses "Bookmark", search run on the title and description field of the bookmarks table, else search run on the name field of the category table in the database (Figure 5).

Figure 5. Search Field

Search Field: Bookmark

1.5.6 Search Method

This option displays search method that users looking for. The user can select "AND" or "OR" on all entered keywords (Figure 6).

Figure 6. Search Method

Method: all(AND) all(AND) any(OR)

1.5.7 Search Match Position

This option shows search word matching position. Using this option, user can retrieve more specific result (Figure 7).

Figure 7. Search Match Position

Match position: any

i.	any
	апу
	begin
	end

1.5.8 Search Sort

This option shows search result order. Using this option, user can retrieve result on users purpose (Figure 8).

Figure 8. Search Sort

Sort by: score

1.5.9 Search Result

This page displays search results that users looking for. The result includes Title, Description, URL and Score for bookmarks. Score imply that how many same URLs are uploaded in database and if number is high, which means many people think this bookmark is important. Search results generated by SQL query since users input key words and submit it. It displayed by 20 matches a page. It also

appeared with more links that represent related search for

user's key words (Figure 9).

Figure 9. Search Result

http://home.netscape.com/bookmark/4_72/netscapesearch.html [related bookmark] • New Netscape Search score:2 What's New and Cool http://home.netscape.com/bookmark/4_72/newnetscapesearch.html [related bookmark] PCMall score:2 Computers and Internet http://home.netscape.com/bookmark/4_72/pcmall.html [related bookmark] • Search some:2 Personal Toolbar Folder http://www.redhat.com/browser/search.html [related bookmark] • Search from Your Browser score:2 What's New and Cool http://home.netscape.com/bookmark/4_72/searchfromyourbrowser.html [related bookmark] • Snap__score:2 Search http://home.netscape.com/bookmark/4_72/snap.html [related bookmark] • Toshiba score:2 Computers and Internet http://home.netscape.com/bookmark/4_72/toshiba.html [related bookmark] [1] <u>[2]</u>

1.5.10 Related Bookmarks

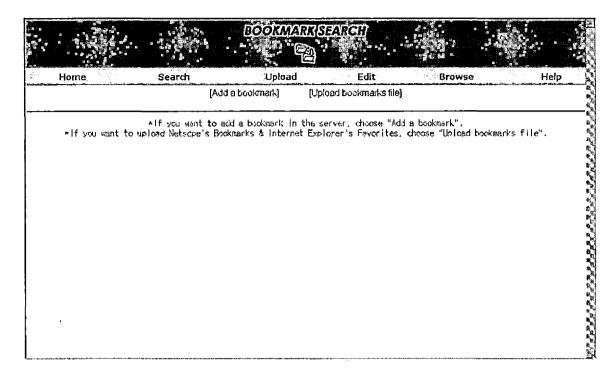
The more related bookmarks links are next to each result links. When users click the link, it allows the user to try the related search page. On this page, user can search related links without typing another key words. These related bookmarks are all in the same category that is organized by each user. After display reference search result, user can try another key words for more information (Figure 10).

Figure 10. Related Bookmarks

		ECOMMAR	\$ 39 3√1GD		
Home	Search	Upload	Edit	Browse	Help
Keyword	s: [🕸 search	
Search Fi	eld: Booksark 🗸	Method: all(AND)	Match position:	any 💌 Sort by: Sc	ore
	Total re	elated bookmark	20 In Category	v: Media	
				·	
CNET Today - Technick	ology News з	core:S			
 http://www.microsoft.com/ CNN Yideoselect so 		iprd≕Windows&sbp=Mee	liaPlaver&ar=Favor	iteåsba=CNET&pver=6	.2
http://www.microsoft.com/	'isa⊳i/redir.dll'	iprd=Windows&sbp=Me	diaPlayer&ar=Favor	iteðsba=CNN&pver=6.	2
• Disney score:3					
 http://www.microsoft.com/ ESPN Sports score(3) 		?prd=Windows&sbp=Me	diaPlayer&ar=Fevor	lteðsba=Disney&pver	=6.2
http://www.microsoft.com/		?prd=Windows&sbp=Me	diaPlayer&ar=Fevor	ite&sba=ESPN&pver=6	.2
 Fox News score(3) 					
http://www.microsoft.com/	'isapi/redir.dll'	?erd=₩indows&sbp=Me	diaPlayer&ar∓avor	iteåsba=FoxNewsåove	r=6.2
 Fox Sports score:3 	(innai/radin dill	2n o al-Mit o alay on Sank on Mar	d'a Diauas Parre	telebor Faulur - Lulu	

1.5.11 Upload

This page allows a user to upload their bookmarks file. User can select "Add a bookmark", if he or she want to add a bookmark in the database, or he or she can choose "Upload bookmarks file" for user's bookmarks file uploading (Figure 11). Figure 11. Upload



1.5.12 Add a New Bookmark

This page allows a user to create a new site by providing title, URL, description, category, email address information and code. This page allows the user to add new site information into MySQL databases (Figure 12). Figure 12. Add a New Bookmark

•

9 10 10 10 10 10 10 10 10 10 10 10 10 10	100	KMARK SEA	RCH	D		
		<u> </u>				
Home	Search	Jploād	Edit t	Browse	•	Help
	[Add a bookma	irk] (Upload	bookmarks file)]		8
*lf you want to edit you	Enter valid information for r bookmark later, provide v Title : URL : Description Category : Email : Code :	valid email addr "anonymous" . http://	Tool), er yeu ce	n leave it

1.5.13 Add a New Bookmark Result

This page display the result of adds a bookmark. It will show the succeed message with user information (Figure 13). Figure 13. Add a New Bookmark Result

Add a new bookmark succeed! User: yulee@cscl.csusb.edu

R

1.5.14 Bookmarks File Upload

This page allows the user to upload a Netscape's Bookmarks file and Internet Explorer's Favorites into the server including site title, URL, description, category, date, email address and code. A bookmark id will be assigned automatically from the bookmark table in database. After fill out input boxes, this page allows user to upload and parsing the file (Figure 14).

Figure 14. Bookmarks File Upload

	Book	MARKER VIEL		and a state of a state
Home	Search	oad	Browse	Help
	[Add a bookmark]	[Upload whole bookmark]		
2 Internet Explorer	ks.html(Win=C:Wprogram filesWme : favtobmk.html(C:Wfavtobm/.htm t your bookmark later, provide File : Email : Code :	D.		

1.5.15 Bookmarks File Browsing

When user click the "Browse" button in the Bookmarks Upload page, pop-up window show up to the user. It allows user to browse all files in the user local machine (Figure 15).

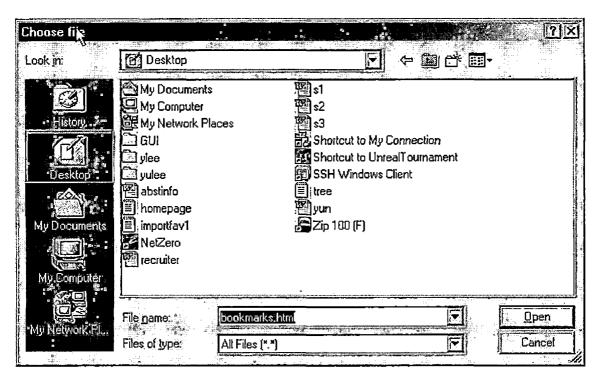
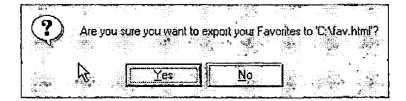


Figure 15. Bookmarks File Browsing

1.5.16 Internet Explorer's Favorites Export

This pop-up window allows the BOOKMARK-SEARCH user to convert the Internet Explorer's Favorites to Netscape's Bookmarks at user's local machine before upload the file (Figure 16).

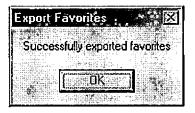
Figure 16. Internet Explorer's Favorites Export



1.5.17 Export Result

This message box explains user's Internet Explorer Favorites converted to a bookmarks file successfully in user's local machine (Figure 17).

Figure 17. Export Result



1.5.18 Bookmarks File Upload Result

This page allows the BOOKMARK-SEARCH user to see the result of uploading and parsing the Bookmarks file. It will describe number of links that uploaded by user. After finished upload, user can check the links that uploaded by user using search engine (Figure 18). Figure 18. Bookmarks File Upload Result

Up Loading Bookmark: 51 User: yulee@csci.csusb.edu

1.5.19 Bookmarks Edit

R

After BOOKMARK-SEARCH user input the valid email address and personal code that was used when they upload or add new bookmarks into the server. This page allows the Bookmark-Search user to update site information and delete links. Current information is displayed first and user can modify information. The site information cannot be changed at any time (Figure 19).

Figure 19. Bookmarks Edit

		1	BOOK	BOOKMARKISEARCHI				
а 5 п. на 6 п. е 45 г. на 1	1. 19 10		17.00 1 - 10 1 - 10					
Home		· Search	Uplo	ad	Edit	Brows	e	Help 🛓
								R, A
	Ente	T) r your email an	nis is BOOKHARK d code that wer	-SEARCH part e provided w	icipants page! When you uplead	your bookmark		
			Emall:					6. 8
			Code:					e
				🕸 g0				E.
								A L
								ik ta
								na Ri Bij
								幹 御 御 御 御 御 御 御 御 御 御 御 御 御 御 御 御 御 御 御

1.5.20 Bookmarks Edit Menu

After BOOKMARK-SEARCH user input the valid email address that was used when they upload whole bookmarks file or add a new bookmark into the server. This page allows the Bookmark-Search user to update site information and delete links. It also provides search in user's own bookmarks file but all uploaded bookmarks database. Current information is displayed first and user can modify information. The site information cannot be changed at any time (Figure 20).

Figure	20.	Bookmarks	Edit	Menu
--------	-----	-----------	------	------

		BOOKMARK M	SANCH .		
Home	Search '	Upload	Edit	Browse	Help
	(View & Up	date] [Delete]	[Search user's	Eoolemarks]	
	In this page, you ca	n choose update, dele	ate or sear <i>c</i> h in	vcur bookmarks	

1.5.21 Bookmarks Update Site

This page allows a BOOKMARK-SEARCH user to update bookmarks information, which was uploaded by user in database. Once the user click modify link, user can submit update button.

It displays user's uploaded bookmarks with last updated date. User can selects the links that should be updated from the list (Figure 21).

		teoriniis E	ingi eta artiko eta a	្មា្លា កិត ពិធី ព្រំដែរ អេ ម៉ូន ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី ស្រី សំរី សំរី សំរី សំរី សំរី សំរី សំរី សំរី សំរី សំរី សំរី
Home	Sear	ch Upload Upload (View & Update) [Delete]	Edit Browse	Help
		ploaded bookmark 47 for us cose the kockmark you want to upo	er "yulee@cscl.csusb.edu"	
	Update	Title	Upload/Update Date	
	modify	Bloomberg	2001-04-39 18:56:36	*************************************
	modify	Buno	2001-04-30 18:46:39	
	modify	Camuor Id	2001-04-30 18:46:39	b
	modify	Capitol Records	2001-04-30 18:46:40	-
	modify	CBS	2001-04-30 18:46:40	
	modify	CNBC Dow Jones Business Video	2001-04-30 18:46:40	6
	modify	CNET Today - Technology News	2001-04-30 18:46:40	ű. T
	modify	CNN Videoselect	2001-04-30 18:46:40	4
	modify	Customize Links	2001-04-30 18:46:40	
	medify	Daily Web Log	2001-04-30 18:46:39	N
	modify	Dan Bricklin Log	2001-04-30 18:46:39	
	modify	Disney	2001-04-30 18:46:40	-
	modify	Eatonweb	2001-04-30 18:46:39	á.
	modify	ESPN Sports	2001-04-30 18:46:40	

Figure 21. Bookmarks Update Site

1.5.22 Bookmarks Update Box

This page shows up current bookmarks information. Using update box, user can modify information. After modify all the information, user can update it with "Update" button (Figure 22).

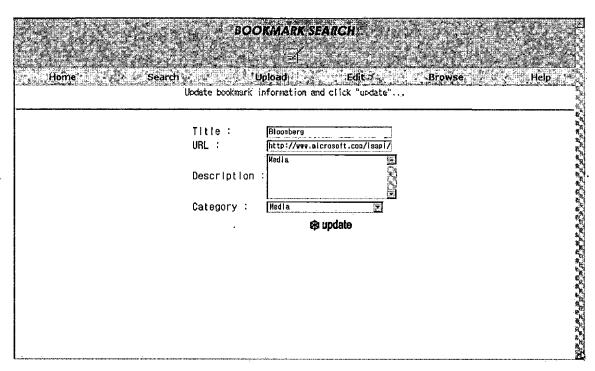


Figure 22. Bookmarks Update Box

1.5.23 Bookmarks Update Result

This page displays the result of update a bookmark. It will show succeed message when user's new bookmarks information inserted into database (Figure 23).

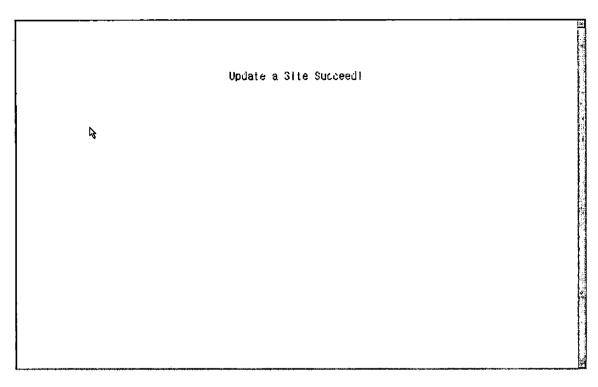


Figure 23. Bookmarks Update Result

1.5.24 Bookmarks Delete Site

This page allows a BOOKMARK-SEARCH user to delete links, which was uploaded by user in database. Once the user click check box, user can submit delete button.

It displays bookmarks list with title and last updated date. User selects all the links that should be deleted and they will be deleted recursively (Figure 24).

	2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	EQUINARIA			2 6 6 6 7 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	េក ស្ត្រីភូនី ស្ត្រីភូនី ស្ត្រីភូនី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រី ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្រ ស្ត្ ស ស ស ស្ត្ ស ស្ត្ ស ស ស ស្ត ស ស្ត ស ស្ត ស ស្ត ស ស្ត ស ស ស ស		ດເຊຍ ຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊີຊ
Нотте ч	Sea	fer filte and a state that a mark of state is a supervised on the supervised and the state of the state of the		t in the	nth Kati (Statistic States) into	owse		Help
		[View & Update] [Delete]	Search	user's Bo	oxmarkj			
		🕸 delet	9					
		uploaded bookmark 47 for tookmarks that will be deleted	-	íck "del	ste" butt	on,		
	Check	Title			oad/Updat			「「「」「」「」「」」「」」「」」」
	R	"Bioonberg			-04-30 16			
	M	Витр		2001	-04-30 16	1:46:39		9 2
	R.	Canworld			-04-30 16			
	R	Capitol Records		2001	-04-30 16	1:46:40		
		CBS		2001	-04-30 16): 46: 40		1
		CNBC Dow Jones Business Vide	9	2001	-04-30 16	8:46:40		
		CNET Today - Technology News	;	2001	-04-30 16	3:46:40		1
	6	CNN Videoselect		2001	-04-30 16	9:46:40		, j
	П	Custonize Links		2001	-04-30 10	3:46:40		1
		Daily Web Log		2001	-04-30 18	3:46:39		
		Dan Bricklin Log		2001	-04-30 10	3:46:39		9 1
		Disney		2001	-04-30 16	3:46:40		
		L.F.L.		l	-04-20-31		L	2

Figure 24. Bookmarks Delete Site

1.5.25 Bookmarks Delete Result

This page displays the result of delete a bookmark. It will show succeed message when user's bookmarks information deleted from database (Figure 25).

Figure 25. Bookmarks Delete Result

Delete :4 Sites Succeed!

R

1.5.26 Search User's Bookmarks

Search in user's bookmarks is a another search tool of the BOOKMARK-SEARCH system, which allows users to find a desired links with the search box in the each user's own uploaded bookmarks but all bookmarks database. This search tool narrows the search area. If BOOKMARK-SEARCH user interested in his or her own bookmarks only, and wants to find data from his or her own uploaded bookmarks, it will help quick search. This page also provides search

conditions such as method, keyword match position and sort option for user (Figure 26).

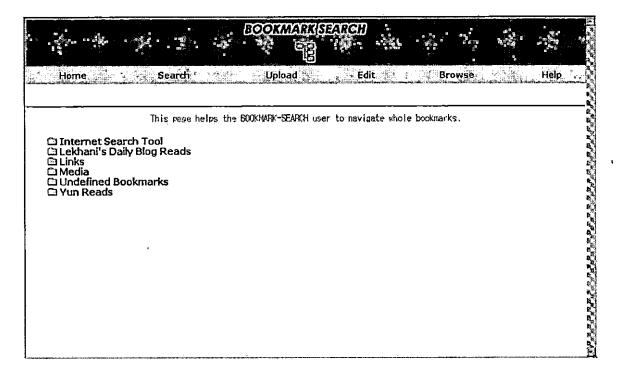
Figure	26.	Search	User's	Bookmarks
--------	-----	--------	--------	-----------

		BOOKMARK	EARCH		
					ê. 42
Home	Search	Upload	Edit.	Browse	Help
	[View & Upd	iate) [Delete]	[Search user's Bo	okmarkj	
	Type keywords, sel	lect search condition	n and then click sea	arch button	
	Keywords:		🗧 🏶 search		8. 4.
	Method: all(AND) 💓	Match position:	any 🗷 Sort by: [1]	tle 💌	l. l.
					10.000 (B).000
					1. E
					6. A
					54 20 20
					*
					* *
					5 5

1.5.27 Browse Category

This page allows the BOOKMARK-SEARCH user to get a glance of uploaded bookmarks information. Current category information is displayed first and user can find bookmarks information clicking each category name (Figure 27).

Figure 27. Browse Category



1.5.28 Browse Bookmarks List

When BOOKMARK-SEARCH user click the category name is displayed on the web page, user can see the list of bookmarks in selected category (Figure 28).

Figure 28. Browse Bookmarks List

	ра в 2005 ра правода по в 2006 ра по в по в р			ន ភូមិ ភូមិ ភូមិ ភូមិ ភូមិ ភូមិ ភូមិ ភូមិ	BOOKMAN E	KSEALOI B				•	
H	ome	S	earch		Upload	E	dit	В	rowse		Help
		Thi	s page he	Ips the E	OOKMARK-SEARCI	luser to navi	igate whol	e bookaar	ks.		
~ 1-											
	nternet Seai ekhani's Dai										
	Bump	.,									
	Camworld										
	Daily Web L	.03									
	Dan Brickli	n Log									
	Eatonweb										
	evhead										
	evolt										
	Infolets										
	Kottke										
	Matt Haughe	5 7									
	Megnut										
	memepool										
	MetaFilter										
	Onfocus										
	Robot Wisdo	na.									
	Tomalak's F	kealm									

<u>1.5.29 Help</u>

This page provides tips for navigating through a BOOKMARK-SEARCH and offers detailed information on such topics as search, upload, update, delete and browse bookmarks (Figure 29). Figure 29. Help

Home	Search	د. مربع بالغريبية المربعينية المربعينية المربعينية المربعينية المربعينية المربعينية المربعينية المربعينية المربع مربعي مربعي مربعي مربعينية المربعينية المربعينية المربعينية المربعينية المربعينية المربعينية المربعينية المربعي	· Upload ···	Ed	lit	Browse	Hei
<u> </u>			Choose the h	elp menu			
	Search	Add	Lipioad {	Update	Delete	Browse	
the spec selects search wi that prov	Ific search an "bookmark", set ill be done in yided with book s are showed up ck the link, i	ea and also ca arch will be d all category kmark at the u p with "relate	an select "and lone in all b name. Users ploading time d search" lin user to try ti	d or "or" for ookmark links. can access the e. After user nk that is nex he related sea	the search If user se ir uploade click the ct to each	rk" or "category" in condition. If we elects "category" d bookmark using search button, de result bookmark, On this page, use	enail enail stred When
user clic	and the second	○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○○	and the second s	ng a manganging in	a service in the	្រស្មែក នុងស្វែកសារ។	A Cusk

1.5.30 Validation

This message box will show up on the screen, when users try to submit information without fill out required boxes (Figure 30).



Figure 30. Validation

1.5.31 Administrator View

This page allows the BOOKMARK-SEARCH administrator to update all users' uploaded bookmarks information. Current user information is displayed first and administrator can modify each user's bookmarks information clicking user name. If administrator wants to delete all bookmarks for a user, s/he can select check box and delete it (Figure 31).

Figure 31. Administrator View

8 2 20 8 2 20 8 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			ECOKMARKSEAR	en:		
Home		Search	Upload	Edit	Browse	Help
						14 R 2 R 2
			🕸 delete			
		Total Pag	ticipants: 3 for BO		ц	R R R R
	Choose liser		d and then click "delete			etail.
	(A10/23) (250)	WHEN BELL AND MEDICAL				etail. 84 84 84 84 84 84 84 84 84 84 84 84 84
•		Check	User	Code		
		<u>त्र</u>	anonymous	1234	_	
		<u> </u>	yulee@cscl.csusb.			
			yulee@csci.csusb.	,edu 1122		2
						S.
						B.T.
		n a la stantan menuar tari menunga menungan pertamban menlar tari bantan batan menungken mentar				È

1.5.32 View and Update in Administrator

This page will show up on the screen, when administrator clicks the user to update a user's bookmarks information in administrator view (Figure 32).

		EOOMARIA		
Home	Searc	h Upload	Edit	Help
		[View & Update] [Delete] [User List]	
	Total up	loaded bookmark 44 for user	"yulee@cscl.csusb.edu"	
	ίλο	ose the tookmark you want to update	e and click "modify"	
	Update	Title	Upload/Update Date	
	modify	CNET Today - Technology News	2001-04-11 00:36:00	
	modify	CNN Videoselect	2001-04-30 18:16:59	R. Contraction of the second se
	modify	Customize Links	2001-04-11 00:35:00	ų.
	modify	Disney	2001-04-11 00:35:00	P
	modify	स्रार्भवड	2001-04-11 00:35:00	S.
	modify	ESPN Sports	2001-04-11 00:36:00	9 1
1	modify	flash5	2001-04-11 00:35:00	10 A
	modify	Fox News	2001-04-11 00:36:00	, the second sec
	modify	Fox Sports	2001-04-11 00:36:00	ζ.
	modify	Free HotMail	2001-04-11 00:36:00	
	modify	hAcKeRz LoUnGe	2001-04-11 00:36:00	3
	modify	Hollywood Online	2001-04-11 00:36:00	4) 11
	modify	http-www.teras.co.kr-	2001-04-11 00:36:00	, in the second s
	modify	Internet Radio Guide	2001-04-11 00:36:00	

Figure 32. View and Update in Administrator

1.5.33 Delete in Administrator

This page will show up on the screen, when administrator clicks the user to delete one or more links in a user's uploaded bookmarks (Figure 33).

Figure 33. Delete in Administrator

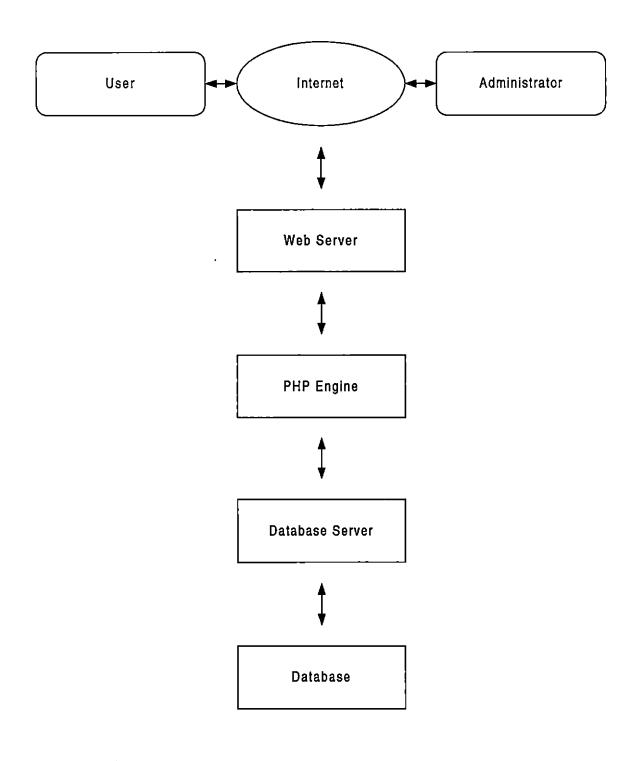
st l	87 . 2010	BOOKMA	RISEARCH	्र य	
ມ ສີຍ ອອຍ ອີ້ສີຍ ອີ້ສີຍ ອີ້ສີຍ ອີ້ສີຍ ອີ້ສີຍ ອີ້ສີຍ ອີ້ສີຍ ອີ້ສີຍ		ອ ລິມັນ ລິມັນ ອີງ ຊາຍສາມ ອີງ ຊາຍສາມ ອີງ ຊາຍສາມ ອີງ ຊາຍສາມ ອີງ ຊາຍສາມ ອີງ ຊາຍສາມ ອີງ ຊາຍສາມ ອີງ ອີງ ອີງ ອີງ ອີງ ອີງ ອີງ ອີງ ອີງ ອີງ		ក ស៊ីត្ម ពីរដ្ឋ ឆ ស្ត្រីត្នុត្ត ថា ស៊ីកីស៊ីកី កំពុង ស្ត្រីត្ន សាស៊ីកីស៊ីកីស៊ីកី កំពុង ស្ត្រីត្រូវ សាស៊ីកីស៊ីកីស៊ីកីស៊ីកីស៊ីកីស៊ីកីស៊ីកីស៊ី	
Home	Sear	ىنىكى يەكەمەرى بىلەرمەن بىلىنىكى ئىلىكى <u>بىلىنى مەكەرىمەن بىلەرمەن بىلەرمەن بىلەر</u>	والمتحدث والمتناكر والمتحد ومحمد والمحافظ المراجع والمترابة	Browst Ser List]	e Help
	Totol	station with the second		Perel cruch adu ^a	
		bookmarks that will be dete			
		······································			•
	Check	Title	[Upload/Update Date	
		Title INET Today ~ Technology	News	Upload/Update Date 2001-04-11 00:36:00	<u>, 1</u> •
	h		News		<u>, 1</u> •
	R	CNET Today - Technology	News	2001-04-11 00:36:00	<u>, 1</u> •
	R	CNET Today - Technology CNN Videoselect	News	2001-04-11 00:36:00 2001-04-30 18:16:55	<u>, 1</u> •
x	र ह ह	CNET Today - Technology CNN Videoselect Customize Links	News	2001-04-11 00:36:00 2001-04-30 18:16:55 2001-04-11 00:36:00	<u>, 1</u> •
	평 평 지 (CNET Today - Technology CNN Videoselect Customize Links Disney	News	2001-04-11 00:36:00 2001-04-30 18:16:55 2001-04-11 00:36:00 2001-04-11 00:36:00	<u>, 1</u> •
	अ अ अ ि ि	CNET Today - Technology CNN Videoselect Customize Links Disney empas	News	2001-04-11 00:36:00 2001-04-30 18:16:55 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00	<u>, 1</u> •
	명 명 지 다 다 다	CNET Today - Technology CNN Videoselect Customize Links Disney emcas ESPN Sports	News	2001-04-11 00:36:00 2001-04-30 18:16:55 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00	<u>, 1</u> •
	명 명 지 다 다 고 고	CNET Today - Technology CNN Videcselect Oustomize Links Disney empas ESPN Sports flash5	News	2001-04-11 00:36:00 2001-04-30 18:16:55 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00	<u>, 1</u> •
	9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CNET Today - Technology CNN Videoselect Oustomize Links Disney empas ESPN Sports flash5 Fox News	News	2001-04-11 00:36:00 2001-04-30 18:16:55 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00 2001-04-11 00:36:00	

1.6 Functional Requirements

The Bookmark-Search operational structures and their requirements are described in this section.

ı,

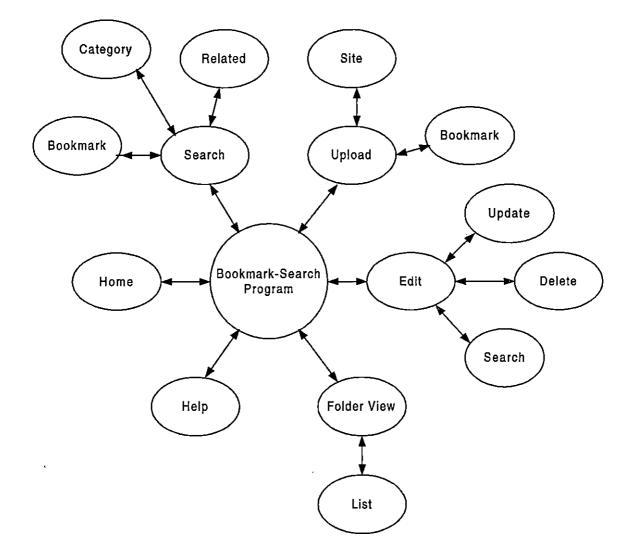
Figure 34. Overall Schema



1.6.2 State Diagram

The following is the state diagram of Bookmark-Search functions.

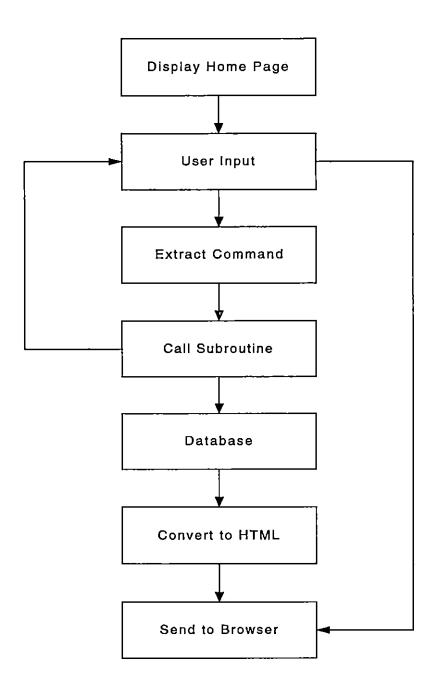
Figure 35. Bookmark-Search State Diagram



1.6.3 Bookmark-Search Algorithm

The following is a algorithm of the Bookmark-Search.

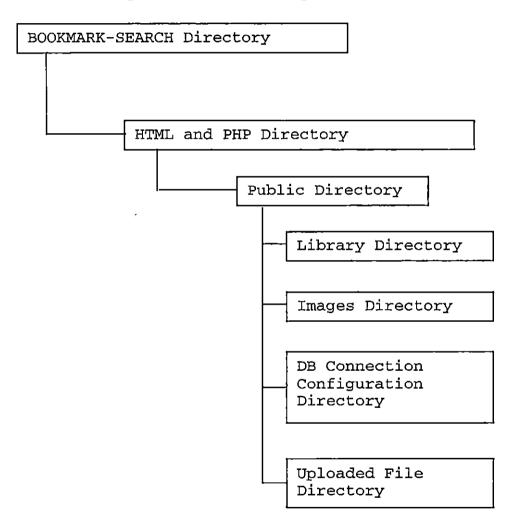
Figure 36. Bookmark-Search Algorithm



1.6.4 Directory Structure

The following is a file and directory structure of Bookmark-Search.

Figure 37. Directory Structure

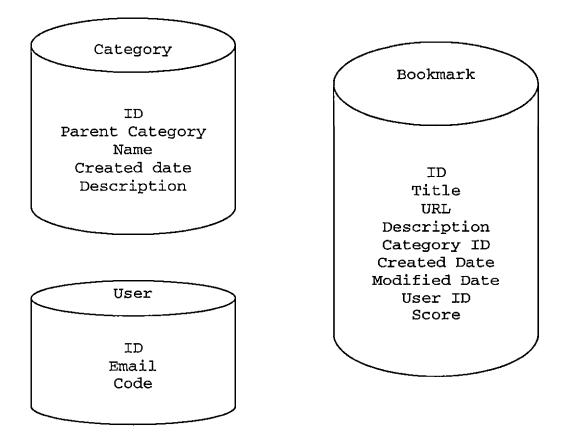


1.6.5 Database Design

This section shows the database design structure of BOOKMARK-SEARCH.

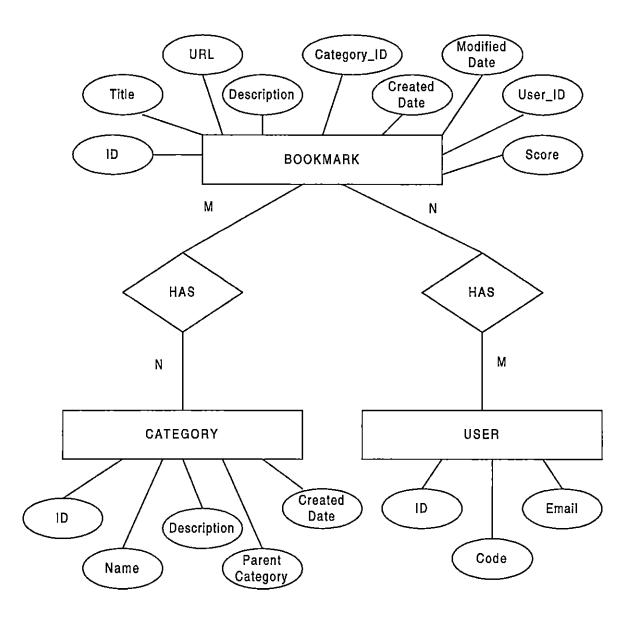
1.6.5.1 Conceptual Model Diagram.

Figure 38. Conceptual Model Diagram



1.6.5.2 Entity Relationship Diagram.

Figure 39. Entity Relationship Diagram



<u>1.6.5.3 Logical Model Table Schema</u>. Each of the following shows a database table, description of attributes and examples.

Table Name:	User
ID:	User ID (number)
Email:	User's email address (text)
Code:	User's password (text)

Table 3. Database Table: User

ID	Email	Code
1	yulee@csci.csusb.edu	1234
2	hijack@yahoo.com	2234
3	lee@hotmail.com	1123

Table Name:	Bookmark
ID:	Bookmark ID generated by DB (int)
Title:	Bookmark Title provided by User (text)
URL:	Bookmark URL provided by User (text)
Description:	Bookmark Description provided by User (text)
Category ID:	Bookmark Category ID provided by User (int)
Created Date:	Bookmark Created date (date)
Modified Date:	Bookmark Modified date (date)

User ID: User ID provided by User (int)

Score: Bookmark Score generated by BOOKMARK-SEARCH

(int)

ID	Title	URL
1	Yahoo	http://www.yahoo.com
2	Altavista	http://www.altavista.com
3	Yourhome	http://www.home.net

Table 4. Database Table: Bookmark

Description	Category ID
Most famous search engine	1
Most famous search engine	1
Home maintain guide	3

Created	Modified	User ID	Score
Date	Date		
1999-8-12	2000-5-13	1	4
1999-2-10	1999-2-10	12	3
2000-12-13	2000-12-15	25	1

Table Name:	Category
ID:	Category ID (int)
Parent:	Parent Category (int)
Name:	Category Name (text)
Creation Date:	Category Creation Date (Date)
Description:	Category Description (text)

Table 5. Database Table: Category

ID	Parent	Category	Creation Date	Description
		Name		
100	101	Internet	04302001	Internet
101	101	Computer and	04222001	IT
		Information	•	
102	101	Networking	03122001	Network

<u>1.6.5.4</u> <u>SQL Commands</u>. The following is a list of the SQL commands used in BOOKMARK-SEARCH implementation.

- CREATE DATABASE db
- DROP DATABASE db
- CREATE TABLE table (column datatype [,column datatype] ...)
- DROP TABLE table

- SELECT select_list FROM table [WHERE conditions][ORDER BY column][ASC|DESC]
- INSERT [INTO] table VALUES (values_list)
- DELETE FROM table [WHERE conditions]
- UPDATE table SET column = expr [,column = expr, ...]

1.7 Performance Requirements

1.7.1 Reliability

The reliability of BOOKMARK-SEARCH was verified via extensive testing of all features.

1.7.2 Efficiency

Since this is an interactive program, the response time for the next display is very important. In order to make this product more efficient, there was careful consideration in the design of the modules and also the size of images for the GUI was kept as small as possible to optimize it.

1.7.3 Testability

Each requirement was identified and tested in the final product.

1.8 Exception Handling

Error messages are displayed on the browser when the system detects an error. The user has a chance to correct the problem.

1.9 Conclusion

The Internet is an important source of the information, however regular search engine's responses often are of low quality for a specific search. This project attempts to solve this problem.

BOOKMARK-SEARCH was developed to satisfy the need of better quality search engine. It offers various functions that make it easy to build and maintain such online search engine. This project also provides suitable online bookmarks management system. User can access his or her uploaded bookmarks from anywhere.

By sharing bookmarks required to upload over the Internet, the system provides an affordable Internet search solution. It uses various mechanisms such as the HTML form based file upload and user friendly GUI. It includes functionalities, which other existing search engines have.

The result of this project is a web-based search engine with bookmarks management system, which retrieves

web site links from a database that consists of donated bookmarks. It is expected that the links will be of better quality than those of a regular search engine. The BOOKMARK-SEARCH takes the advantages of the regular bookmarks and the web based search engine. It will help users to get their valuable information from the Internet efficiently. BOOKMARK-SEARCH combines both the merit of the search engine and the bookmarks management system.

User can modify uploaded information providing email and 4digit password code to access his or her own bookmarks.

Problems to be solved include parsing and containing an appropriate search engine.

1.10 Proposed Future Development

- BOOKMARK-SEARCH system was developed and implemented in PHP on Redhat Linux 7.0. BOOKMARK-SEARCH only allows user to find specific file to upload. To add autobrowsing function, it can be modified to run with JavaApplet.
- There can be many similar category names in the user's bookmarks or favorites. To guarantee a Category name,

BOOKMARK-SEARCH system should be improved to more intelligent search engine.

3. BOOKMARK-SEARCH has a bookmarks scoring functionality. It keep tracks number of same URLs in the database. To extend the feature of system, more sophisticated scoring is needed such as gathering information about site satisfaction.

1.11 Acceptance Criteria

1.11.1 Test Acceptance Criteria

The final product has met all requirements stated in this document (Section 1.6, Section 1.7). It was tested in conformance with the following test criteria.

1.11.2 Unit Testing

The Unit testing focuses on the verification effort of the smallest unit of BOOKMARK-SEARCH system. The operation of each function and GUI was tested and results of the tests are summarized in Table 6.

Table 6. Unit Testing

Unit Tested	Test Performed	X
Bookmark Search	Tested for display desired links in DB	х
Related Search	Tested for display more related links in DB	Х
Add New Bookmark	Tested for insert into new bookmarks values in DB	X
Browse Bookmarks File	Tested to verify browsing function	Х
Netscape's Bookmarks Upload	Tested for upload a bookmarks file to the server	Х
Internet Explorer's Favorites Export	Tested for convert favorites directory to a bookmarks file	х
Internet Explorer's Favorites Upload	Tested for upload a converted favorites file to the server	х
Edit Bookmarks	Tested for display bookmarks edit page	x
Input Email	Tested for display bookmarks that uploaded by email user	x
Update Bookmark Information	Tested for update a bookmark information	x
Delete Bookmarks	Tested for validate delete bookmarks function	x
Browse category	Tested for browse function	X

1.11.3 Integration Testing

The Integration testing focuses on the verification effort of the links between each functional page of BOOKMARK-SEARCH system. The Result of the tests is summarized in Table 7.

Table	7.	Integration	Testing
-------	----	-------------	---------

Role	User Input	Desired Output	X
BOOKMARK -SEARCH	Click the Home link	Display BOOKMARK- SEARCH Home page	x
User	Click the Search link	Display the Search page	x
	Click the Upload link	Display New Bookmark Add page Display the Netscape's Bookmarks and Internet Explorer's Favorites uploading page	X
	Click the Edit Site link	Display Bookmarks Modify and Delete page	X
	Click the Browse Site link	Display Bookmarks Browse page	X
	Click the Help Site link	Display BOOKMARK- SEARCH Help page	x

1.11.4 System Testing

In this phase of testing, BOOKMARK-SEARCH is tested as a site operator.

.

Table 8. System Testing

Unit Tested	Test Performed	X
Access Database system	Tested for access DB system	x
System error	Tested for exception handling	X

PHP:

A server-side, cross-platform, HTML-embedded scripting language used to create dynamic web page. PHP is Open source software.

Cross-platform:

A term that describes a language, software application or hardware device that works on more than one system platform (e.g. Redhat Linux, Microsoft Windows).

JavaScript:

Netscape's simple, cross-platform, World Wide Web scripting language, only very vaguely related to Java.

Apache:

A HTTP server for Unix, Windows NT, and other platform. Apache was developed in early 1995, based on code and ideas found in the most popular HTTP server of the time, NCSA httpd 1.3. It has since evolved to rival (and probably surpass) almost any other Unix based HTTP server in terms of functionality, and speed. Since April 1996 Apache has been the most popular HTTP server on the

Internet, in May 1999 it was running on 57% of all web servers.

HTML:

.

Hypertext Markup Language is the most popular on the Internet.

-

GUI:

Graphical User Interface.

CHAPTER TWO

DETAILED DESIGN

This chapter presents the refinements of the architecture of BOOKMARK-SEARCH system. What follows is the description of each main function of BOOKMARK-SEARCH system. For each of the main function algorithm is given in pseudo language.

1. Function Name	BOOKMARK-SEARCH
Where Used	BOOKMARK-SEARCH
Purpose	Display Menu
Subitems	
Note	_

```
Procedure BOOKMARK-SEARCH
Begin
Declare Variables
Extract Command
If there is Command
Else
Display Menu Page
End If
End
```

2. Function Name Search Where Used BOOKMARK-SEARCH Purpose Conduct Search Subitems Bookmark Search, Category Search, Related Search Note

Procedure Search Begin Extract Keywords

```
Extract Search Field
Extract Search Conditions
If Keywords are not exist
Display Error Message
Else IF Search Field is Bookmark
Execute Bookmark Search Command
Else
Execute Category Search Command
End If
```

```
End
```

3. Function Name	SearchBmk
Where Used	Search
Purpose	Conduct Search in Bookmark
Subitems	
Note	

```
Procedure SearchBmk
Begin
     Extract Keywords
    Extract Search Conditions
          Keywords are not exist
     If
          Display Error Message
     Else
     Trim Keywords
     Verify Search Condition
     Count Keywords
     Split if not Single Keywords
     Establish DB Connection
     While there is Keywords for search
          If Keywords Found
               Count Result
               If Results are over 20 bookmarks
                    Display Search Results include
                    Bookmark Title, Score,
                    Description, URL and Related link
                    Until 20 bookmarks
                    Display rest in Next Page
               Else
                    Display all Results
               End If
          Else
               Display not Found Message
          End If
```

End If Close DB Connection

End

4. Function Name	SearchCat
Where Used	
Purpose	Conduct Search in Category
Subitems	
Note	

```
Procedure SearchCat
Begin
    Extract Keywords
    Extract Search Conditions
          Keywords are not exist
     If
          Display Error Message
    Else
     Trim Keywords
    Verify Search Condition
     Count Keywords
     Split if not Single Keywords
     Establish DB Connection
    While there is Keywords for search
          If Keywords Found
               Display Search Results include Category
               Name and Related Bookmark link
          Else
               Display not Found Message
          End If
     End If
     Close DB Connection
```

End

5. Function Name	
Where Used	Search
Purpose	Search bookmarks that uploaded in the same category
Subitems	
Note	

Procedure SearchReference Begin Extract Keywords and category id Extract Search Conditions

```
If
          Category Id in not exist
          Display Error Message
     Else
    Verify Search Condition
     Establish DB Connection
     If Keywords category id Found
          If Results are over 20 bookmarks
                    Display Search Results include
                    Bookmark Title, Score, Description
                    and URL
                    Until 20 bookmarks
                    Display rest in Next Page
          Else
               Display all Results
          End If
     Else
          Display not Found Message
     End If
     Close DB Connection
End
```

6. Function Name	UploadStart
Where Used	BOOKMARK-SEARCH
Purpose	Display Upload Menu
Subitems	BookmarkNew, UploadBookmark
Note	

```
Procedure UploadStart
Begin
Declare Variables
Extract Command
If there is Command
Extract Command
If BookmarkNew
Go To BookmarkNew
Else
GO TO UploadBookmark
End If
Else
Display Menu Page
End If
```

7. Function Name	BookmarkNew
Where Used	UploadStart
Purpose	Upload a User Bookmark
Subitems	BookmarkCreate
Note	

```
Procedure BookmarkNew
Begin
Get Title, URL, Description, Category, Email and
Code
If Email and Code
Decrypt Code
Go To BookmarkCreate
End If
End
```

8. Function Name	
	BookmarkNew
Purpose	Add a new Bookmark to Bookmark DB
Subitems	URL Validation, Email Validation and
	Code Validation
Note	

```
Procedure BookmarkCreate
Begin
Extract Request Method
If Request Method is POST
Establish DB Connection
Insert Bookmark Information into DB
Show success Message
Go To BookmarkNew Page
Else
Return Error Message
Go To BookmarkNew Page
End if
Close DB Connection
End
```

9. Function Name	URL Validation
Where Used	BookmarkCreate
Purpose	Bookmark URL validation
Subitems	
Note	

```
Procedure URL Validation
Begin
Get Bookmark URL
If Valid URL
Return True
Else
Return Error Message
Go To Previous Page
End If
```

End

10. Function Name	Email Validation
Where Used	BookmarkCreate
Purpose	Bookmark URL validation
Subitems	
Note	

```
Procedure Email Validation
Begin
Get Bookmark URL
If Valid URL
Return True
Else
Return Error Message
Go To Previous Page
End If
```

End

11. Function Name	
Where Used	BookmarkCreate
Purpose	Bookmark Code validation
Subitems	
Note	

```
Procedure Code Validation
Begin
Get Bookmark URL
If Valid URL
Return True
Else
Return Error Message
Go To Previous Page
End If
End
```

12. Function Name	UploadBookmark
Where Used	UploadStart
Purpose	Uploading User's Bookmark
Subitems	ExportFavorites, Upload,
	ImportBookmark
Note	

```
Procedure UploadBookmark
Begin
Get Bookmark file, Email and Code
If Email and Code
Decrypt Code
Go TO ImportBookmark
End If
```

End

13. Function Name	ExportFavorites
Where Used	UploadBookmark
Purpose	Export Internet Explorer's
	Favorites
Subitems	
Note	

```
Procedure ExportFavorites
Begin
IF User's Browser is Internet Explorer
Conduct Export
Save on Local User Machine
Else
Go To Next
End IF
End
```

```
14. Function Name Upload
Where Used UploadBookmark
Purpose Upload Specified File
Subitems
Note
```

```
Procedure Upload
Begin
IF File is not Empty
Upload User's File on the Server
Else
```

Display Error Message

End IF

End

15.Function Name	ImportBookmark
Where Used	UploadBookmark
Purpose	Import User's Bookmark
Subitems	GetTitle, GetURL, GetDescription,
	GetDate
Note	

Procedure ImportBookmark Begin If File is not Empty Open File Declare Variables While there is a Row in File Extract Row Establish DB Connection If Category Information Get Name Get Description Get Date Insert into DB Else If Bookmark Information Get Title Get URL Get Description Get Date Get User Information Insert into DB Else Return False End If Display Uploading Results Close DB Connection Else Display Error Message End IF End

16.Function Name	GetTitle
Where Used	ImportBookmark
Purpose	Get Bookmark Title
Subitems	
Note	

```
Procedure GetTitle
Begin
Extract Title from Bookmark
Return Title
End
```

17.Function Name	GetURL
Where Used	ImportBookmark
Purpose	Get Bookmark URL
Subitems	
Note	

```
Procedure GetURL
Begin
Extract URL from Bookmark
Return URL
End
```

```
18.Function Name GetDescription
Where Used ImportBookmark
Purpose Get Bookmark Description
Subitems
Note
```

```
Procedure GetDescription
Begin
Extract Description from Bookmark
If Description is not Empty
Get Store Description
Else
Get Store Category Name
End IF
Return Description
End
```

19.Function Name	GetDate
Where Used	ImportBookmark
Purpose	Get Bookmark Date
Subitems	
Note	

```
Procedure GetDate
Begin
Extract Date from Bookmark
Return Date
End
```

20.Function Name	EditStart
Where Used	BOOKMARK-SEARCH
Purpose	Display product information in detail
Subitems	EditLogin, EditMenu
Note	

```
Procedure EditStart
Begin
Declare Variables
Display Login Window
If there is Input
Extract Input
Go To Login
Else
Display Current Page
End If
```

End

21.Function Name	EditLogin
Where Used	EditStart
Purpose	Validation User Information
Subitems	
Note	

```
Procedure EditLogin
Begin
If Method is POST
Get User Email and Code
Establish DB Connection
Compare User Information From DB
If Login Correct
```

```
Go To Edit Menu
Else
Display Error Message
Go To Login Page
End If
Close DB Connection
Else
Display Error Message
End IF
```

```
End
```

22.Function Name	EditMenu
Where Used	EditStart
Purpose	Display User Bookmark Edit Menu
Subitems	EditUpdate, EditDelete, EditSearch
Note	

```
Procedure EditMenu
Begin
Declare Variables
Extract Command
If there is Command
Else
Display Menu Page
End If
End
```

23.Function Name	
Where Used	EditMenu
Purpose	Display User Bookmark Information
Subitems	ModifySite
Note	

```
Procedure EditUpdate
Begin
If Method is POST
Establish DB Connection
Extract User Info
If Valid User ID and Password
Retrieve User's Bookmark Information
From DB
Display Information with Modify Link
Else
```

```
Display Error Message
End If
Close DB Connection
Else
Display Error Message
End If
End
```

24.Function Name	
Where Used	EditUpdate
Purpose	Update User Bookmark Information
Subitems	UpdateSite
Note	

```
Procedure ModifySite
Begin

If Method is POST

Establish DB Connection

Display Current User Bookmark Information

If Session has Bookmark ID

Go To UpdateSite

Else

Display Error Message

Go to EditUpdate

End If

Else

Display Error Message

End If
```

End

25.Function Name	UpdateSite
Where Used	ModifySite
Purpose	Get Changed User's Bookmark
1	Information
Subitems	
Note	

```
Procedure UpdateSite
Begin
If Method is POST
Establish DB Connection
Extract changed User Bookmark Information
If Session has Bookmark ID
```

```
Insert changed Bookmark Information to
               DB
               Go To EditUpdate
          Else
               Display Error Message
               Go to EditUpdate
          End If
     Else
          Display Error Message
     End If
End
```

26.Function Name Where Used	
Purpose	Display User Bookmark Information
Subitems	DeleteSite
Note	

```
Procedure EditDelete
Begin
     If Method is POST
          Establish DB Connection
          Extract User Info
          If Valid User ID and Password
               Retrieve User's Bookmark Information
               From DB
               Display Bookmark Information
          Else
               Display Error Message
          End If
          Close DB Connection
     Else
          Display Error Message
     End If
```

```
End
```

27.Function Name	DeleteSite
Where Used	EditDelete
Purpose	Delete Checked Bookmark
Subitems	
Note	

Procedure DeleteSite

```
Begin
     If Method is POST
          Establish DB Connection
          Extract changed User Bookmark Information
          If Session has Bookmark ID
               Delete checked Bookmark Information
               from DB
               Go To EditDelete
          Else
               Display Error Message
               Go to EditDelete
          End If
     Else
          Display Error Message
     End If
End
```

28.Function Name	EditSearchSite
Where Used	BOOKMARK-SEARCH
Purpose	Search in User Bookmark
Subitems	
Note	

```
Procedure EditSearchSite
Begin
Extract Keywords
Extract Search Conditions
Split if not Single Keywords
Establish DB Connection
While there is Keywords for search
If Keywords Found
Display Search Results
Else
Display Error Message
End If
Close DB Connection
```

End

· · · · · · · · · · · · · · · · · · ·	
29.Function Name	
Where Used	BOOKMARK-SEARCH
Purpose	Display Category
Subitems	TreeBookmark
Note	

```
Procedure TreeCategory
Begin
If Method is POST
Establish DB Connection
Extract Category Information
Display Category
Else
Display Error Message
End If
End
```

30.Function Name	TreeBookmark
	TreeCategory
Purpose	Display Bookmark
Subitems	
Note	

```
Procedure TreeBookmark
Begin
If Method is POST
Establish DB Connection
If Category is Selected
Extract Bookmark Information
Display Bookmark
Else
Display Error Message
End If
End
```

31.Function Name	
Where Used	BOOKMARK-SEARCH
	Display User information
Subitems	
Note	

Procedure Admin

Begin If Method is POST Establish DB Connection If Administrator is Selected Extract Users Information Display Users Else Display Error Message End If End

REFERENCES CITED

.

[1] Jesus Castagnetto, Harish Rawat, Sascha Schumann,Chris Scollo, Deepak Veliath, Professional PHP Programming,Wrox, 1999

[2] MySQL Database

http://www.mysql.com

[3] How Search Engines Work

http://searchenginewatch.com

[4] Search engine tutorial

http://www.deadlock.com/promote/search-engines/

[5] Tom Negrino, Dori Smith, JavaScript 3rd Edition,

Peachpit, 1999

[6] Matt Welsh, Lar Kaufman, Running Linux, O'Reilly & Associates, Inc., 1996

[7] Laura Lemay, HTML 4, Sams.net, Inc., 1997

[8] ColdFusion

http://www.allaire.com

[9] PHP Programming

http://www.php.net

[10] Apache Web Server

http://www.apache.org