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Bookmark search: A web-based bookmark search engine

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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

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TABLE OF CONTENTS

ABSTRACT

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 server-side 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.

LIST OF TABLES

LIST OF FIGURES

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 easy-to-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)

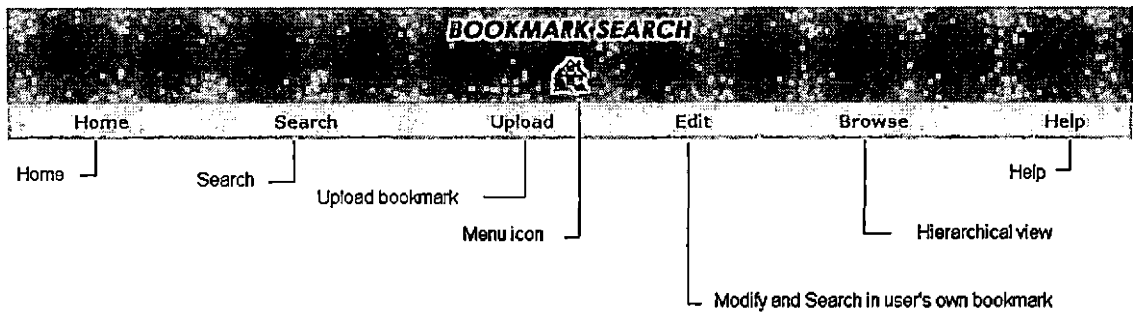
BOOKMARK-SEARCH GUI offers an easy way to upload Netscape's BOOKMARK and Internet Explorer's FAVORITES. It also provides a search tool in all uploaded bookmarks, a search tool in user's own bookmarks, folder view, update

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).

Figure 1. Menu



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.

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

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

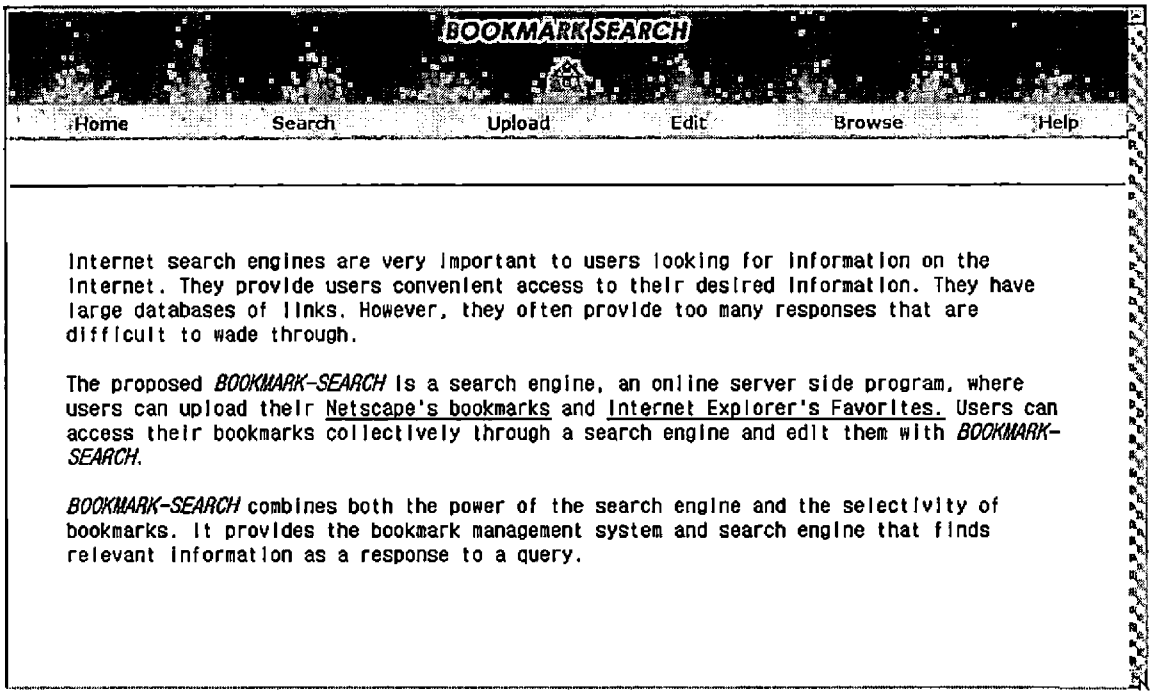
Table 2. User Inputs and Corresponding Actions for User Sub Menu

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).

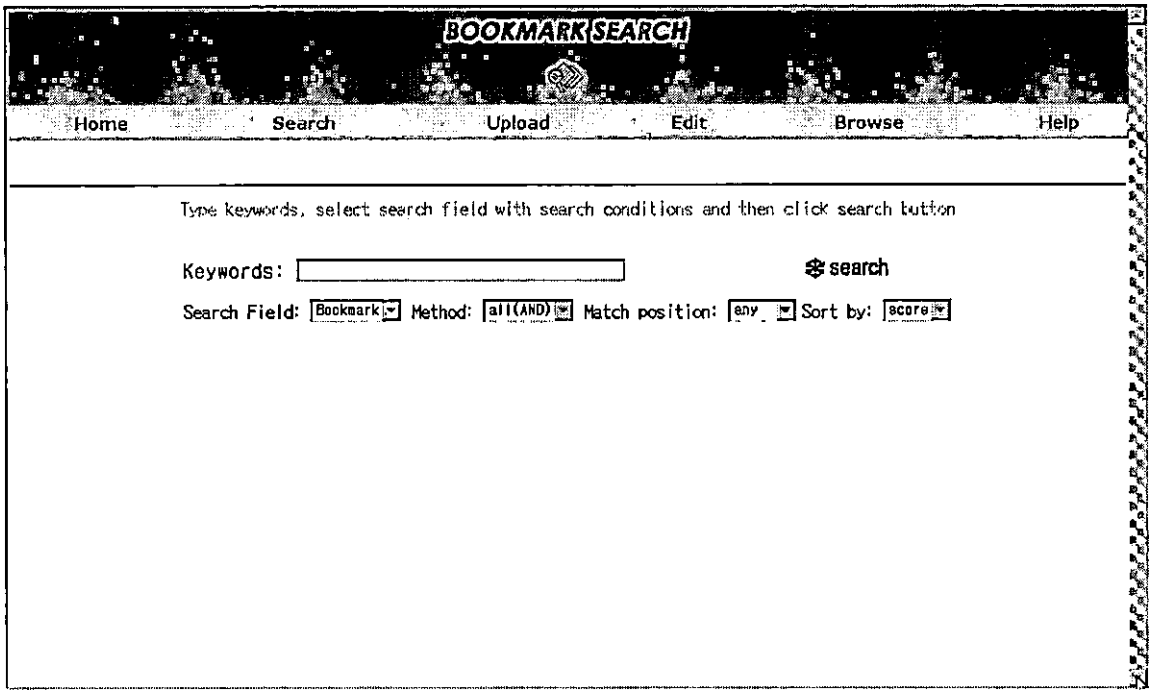
Figure 2. Home



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).

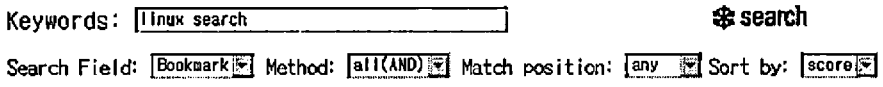
Figure 3. Search



1.5.4 Search Box

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

Figure 4. Search Box



1.5.5 Search Field

Search area consists of two fields. If user chooses "Bookmark", search run on the title and description field

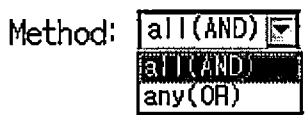
of the bookmarks table, else search run on the name field of the category table in the database (Figure 5).

Figure 5. Search Field

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).

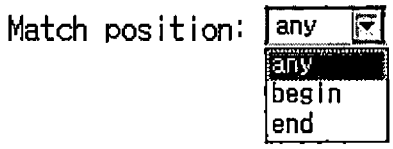
Figure 6. Search Method



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



1.5.8 Search Sort

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

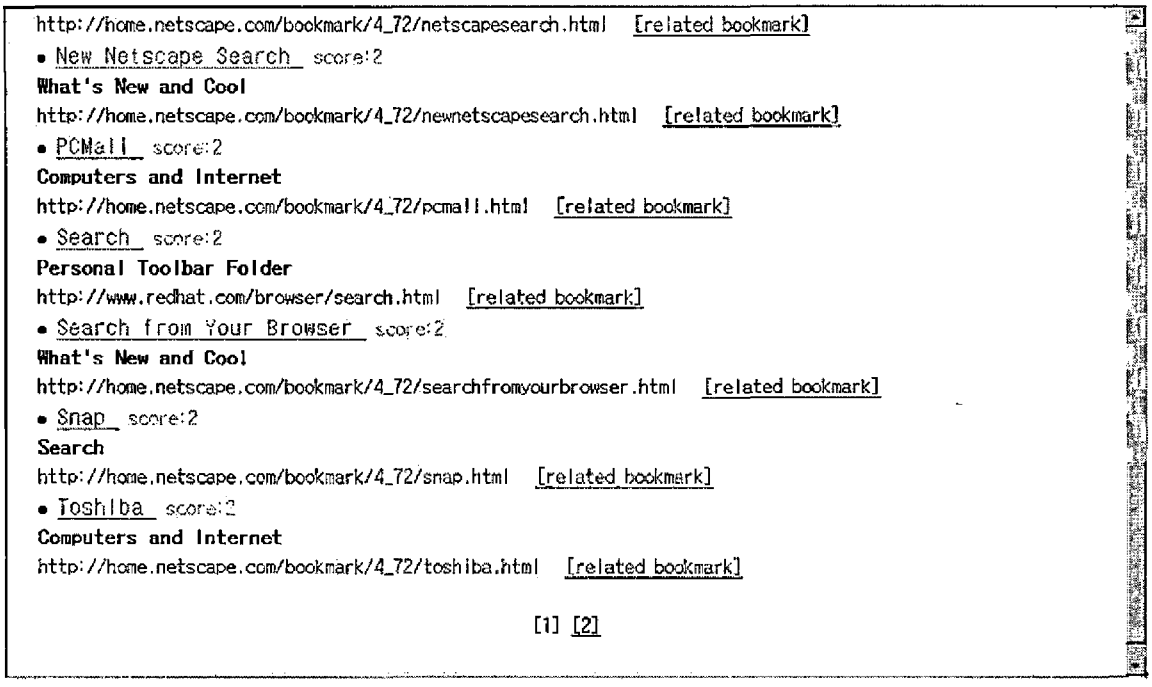
Figure 8. Search Sort

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).

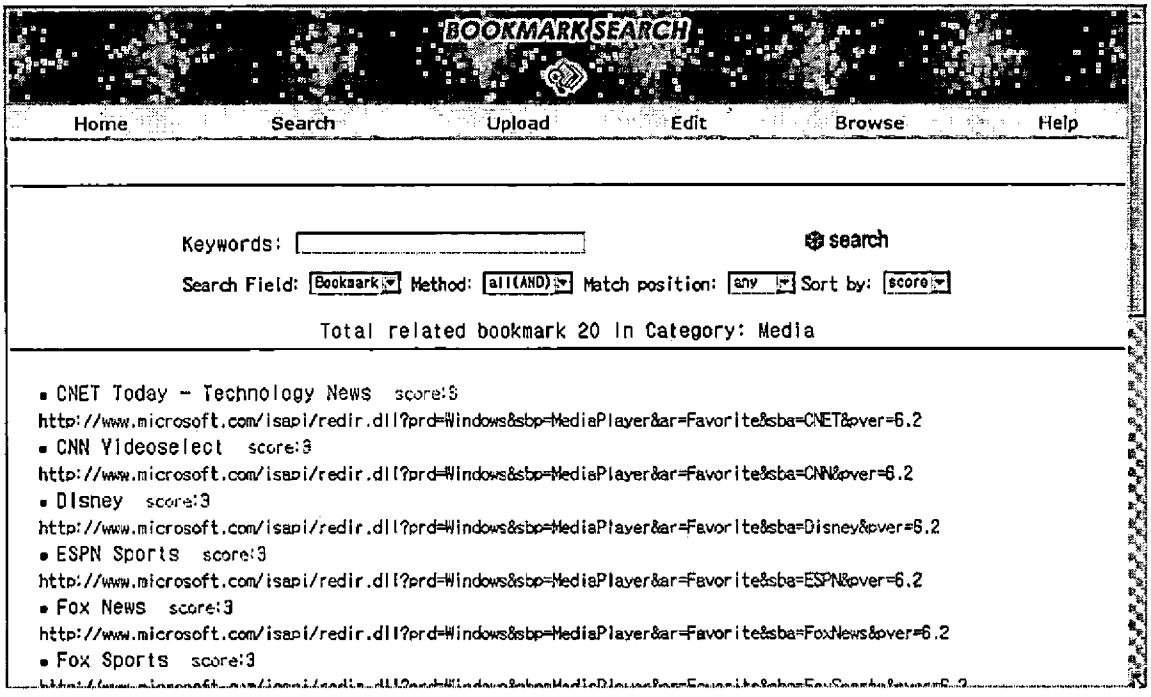
Figure 9. Search Result



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).

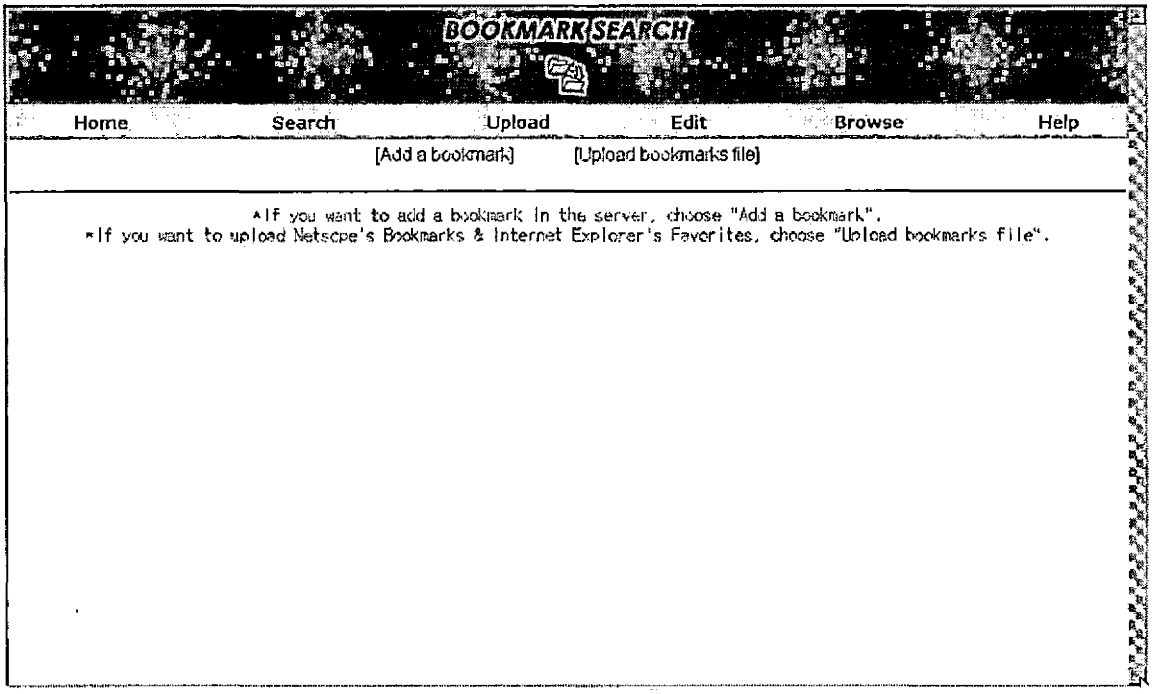
Figure 10. Related Bookmarks



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).

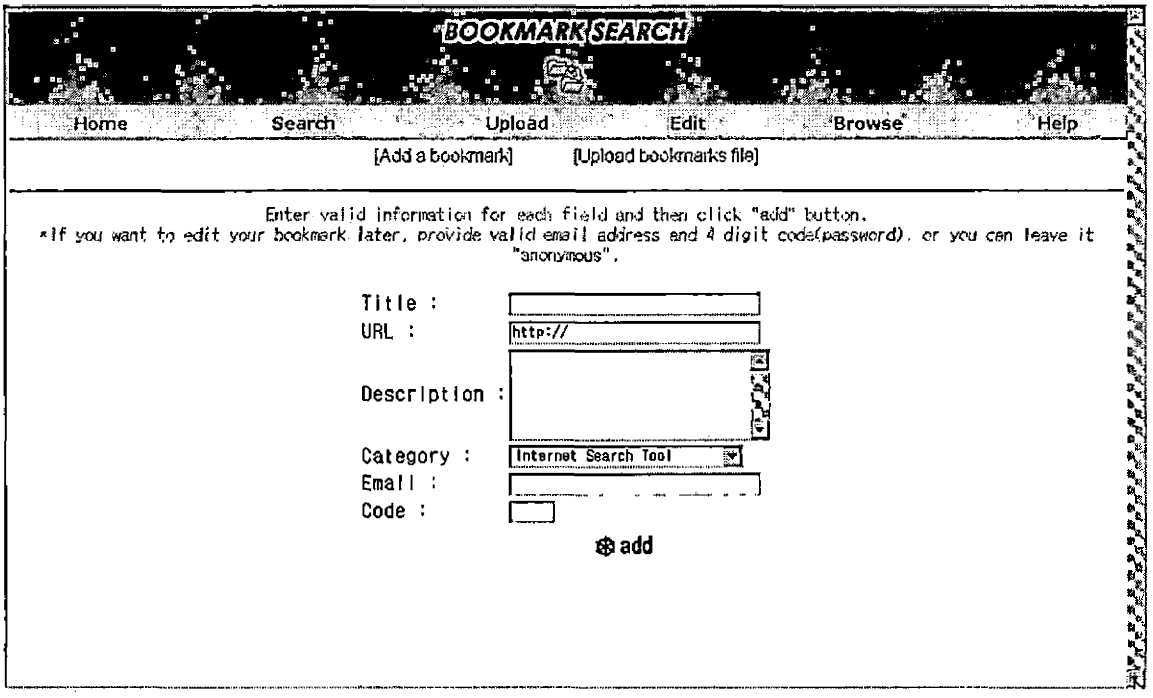
Figure 11. Upload



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).

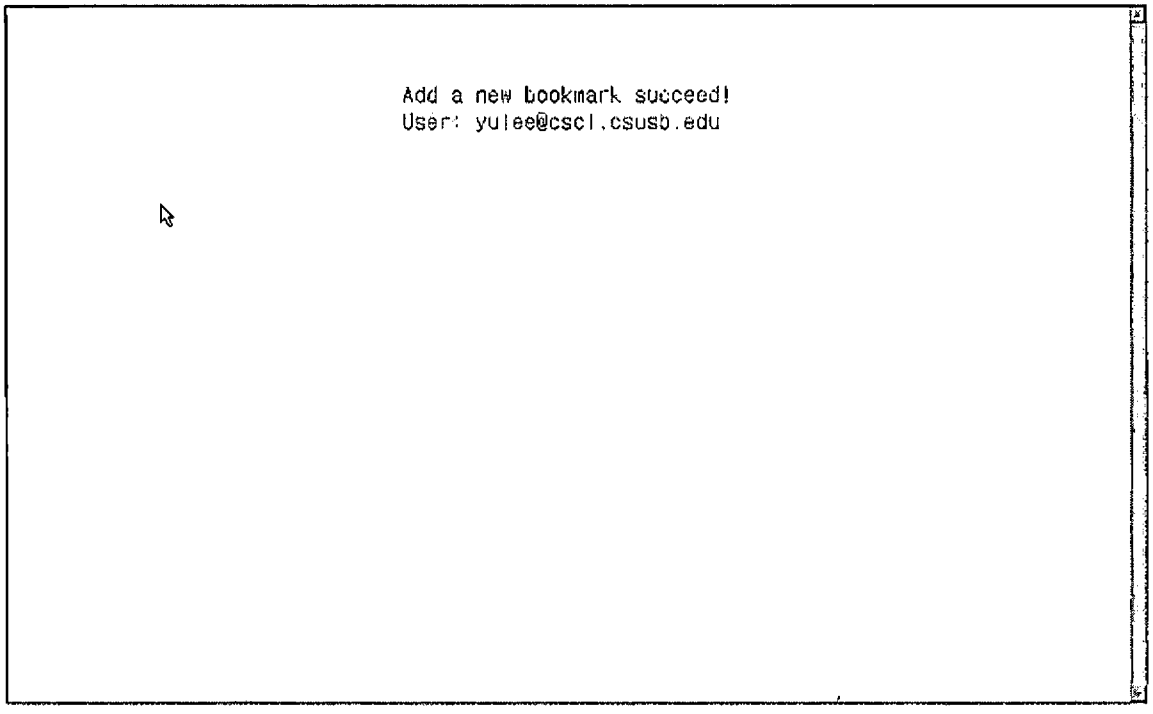
Figure 12. Add a New Bookmark



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).

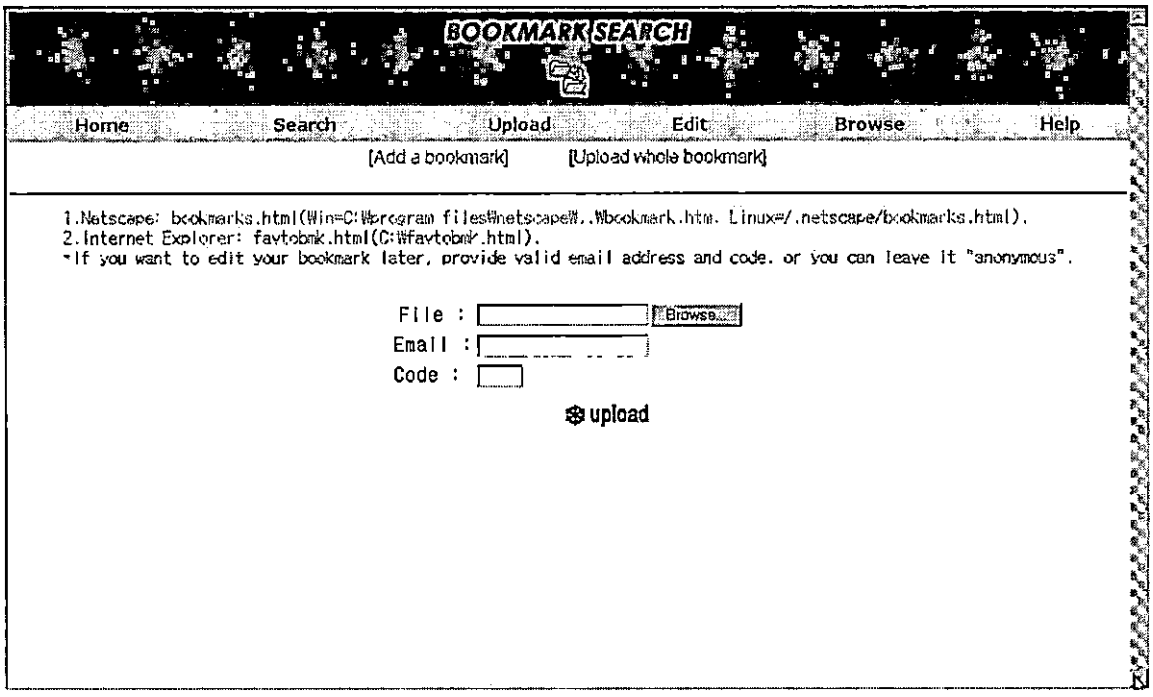
Figure 13. Add a New Bookmark Result



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).

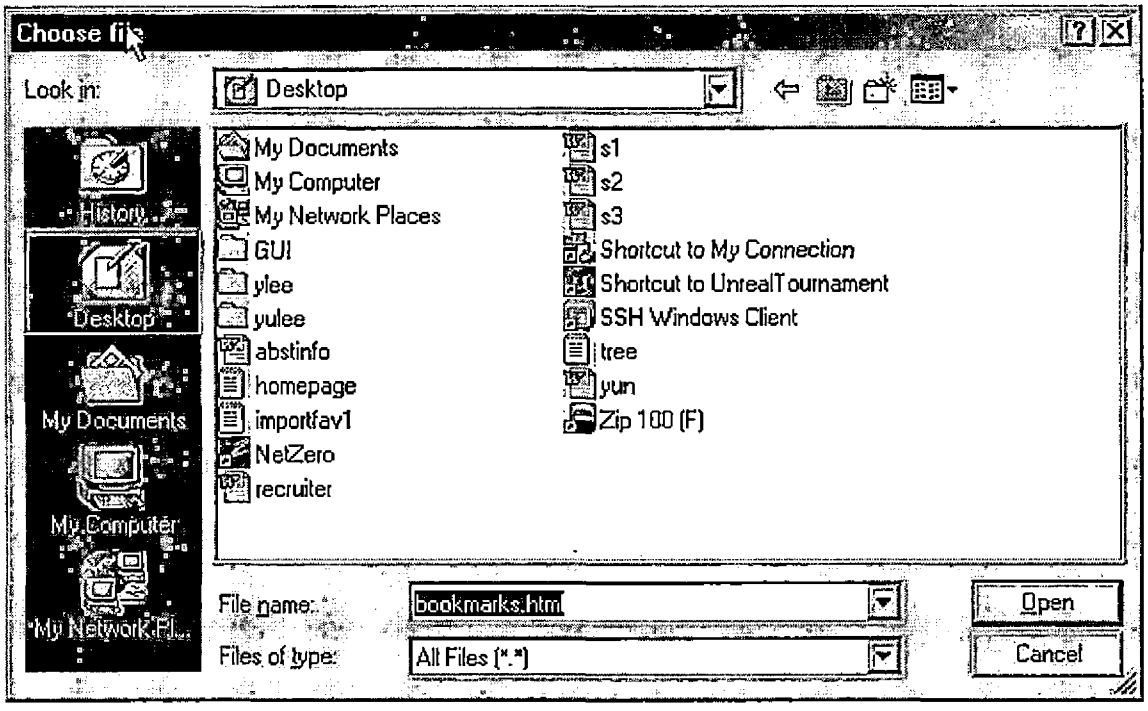
Figure 14. Bookmarks File Upload



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).

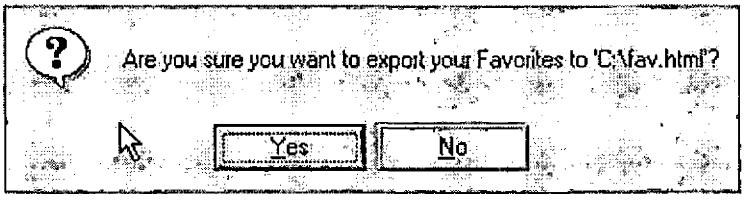
Figure 15. Bookmarks File Browsing



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).

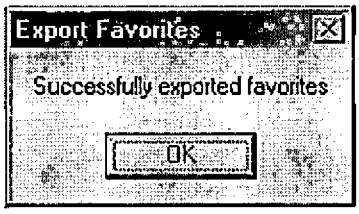
Figure 16. Internet Explorer's Favorites Export



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).

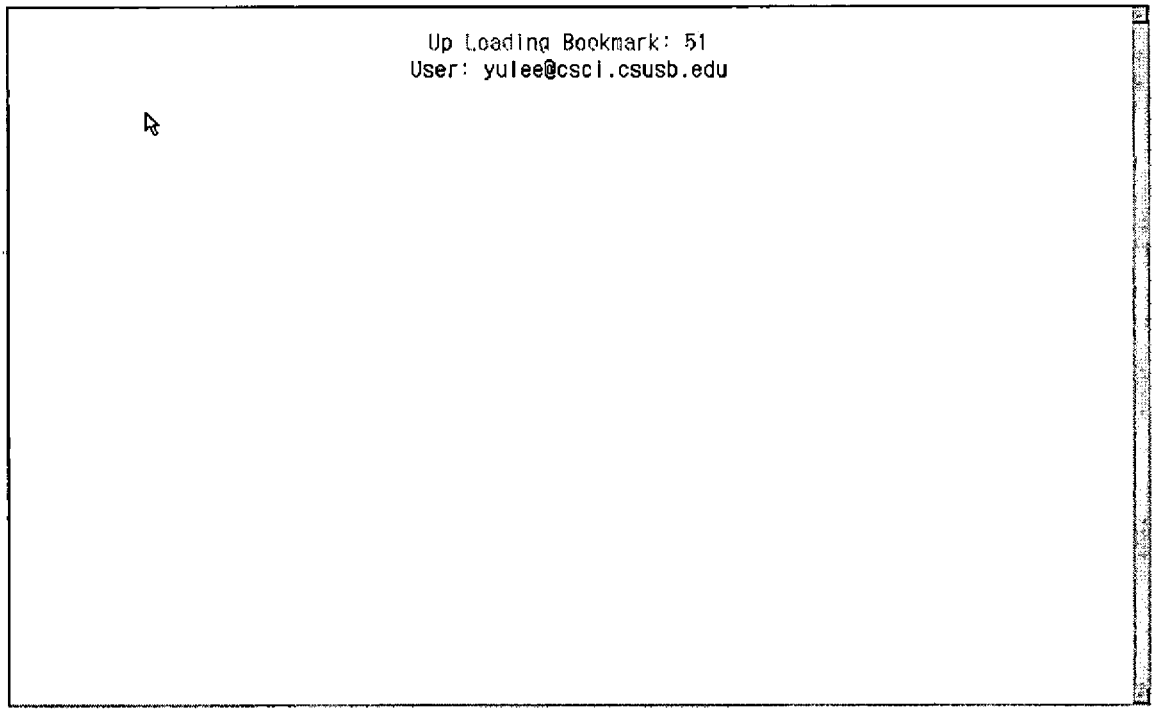
Figure 17. Export Result



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).

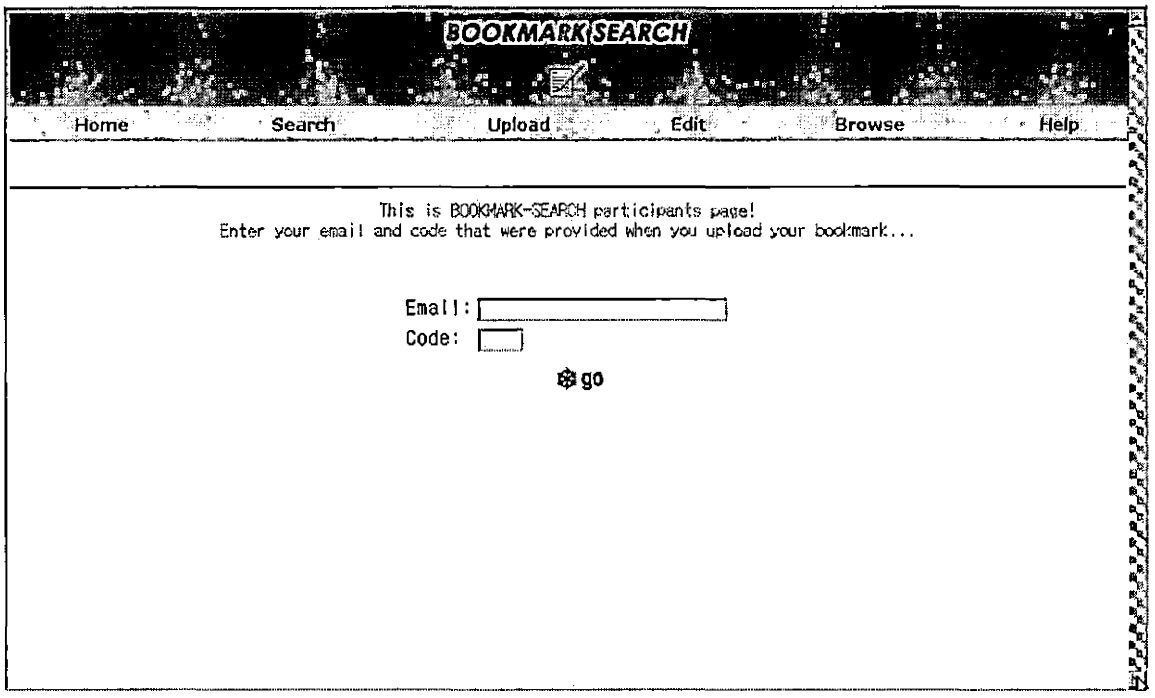
Figure 18. Bookmarks File Upload Result



1.5.19 Bookmarks Edit

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).

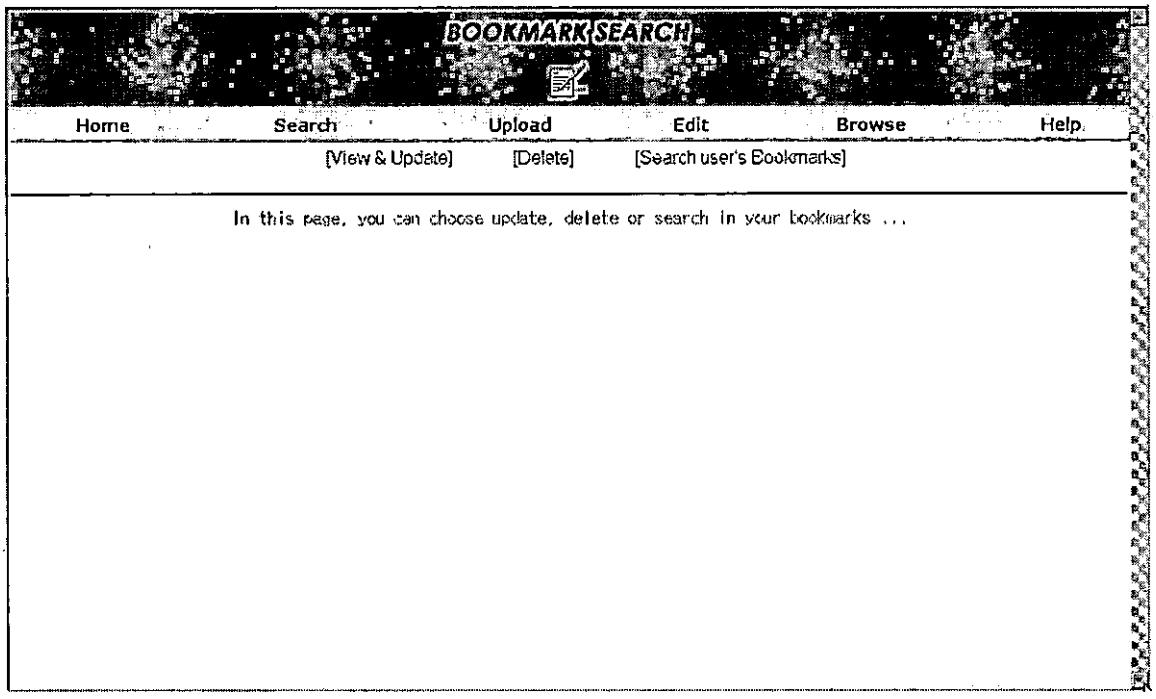
Figure 19. Bookmarks Edit



1.5.20 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

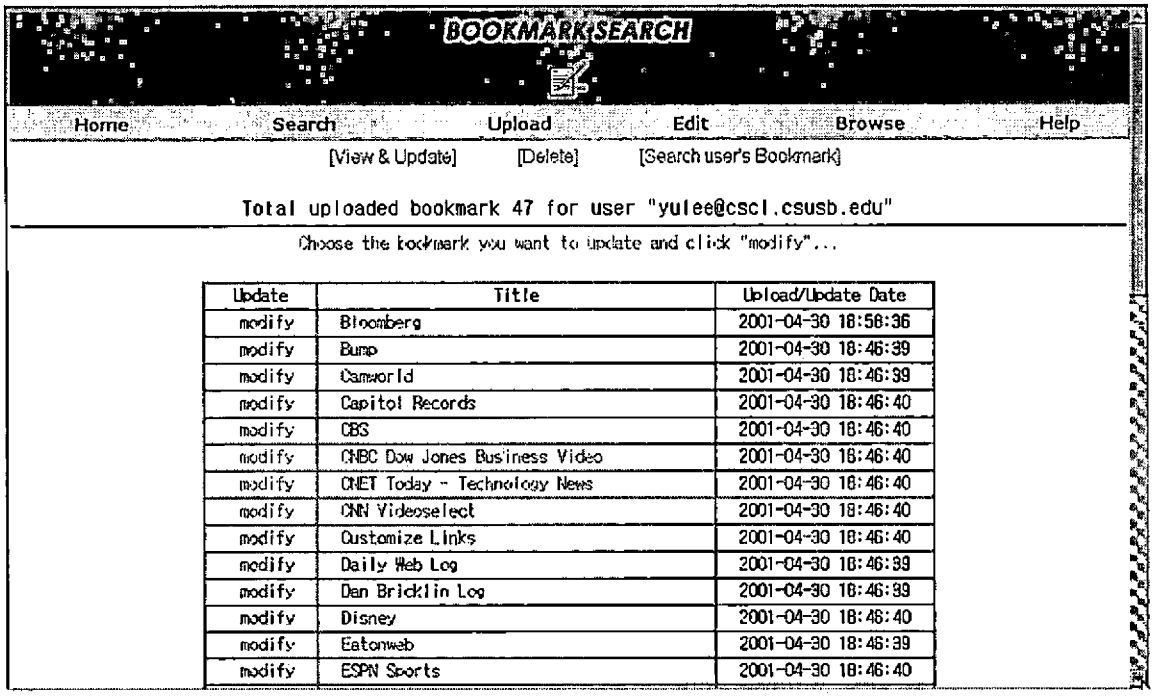


1.5.21 Bookmarks Update Site

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).

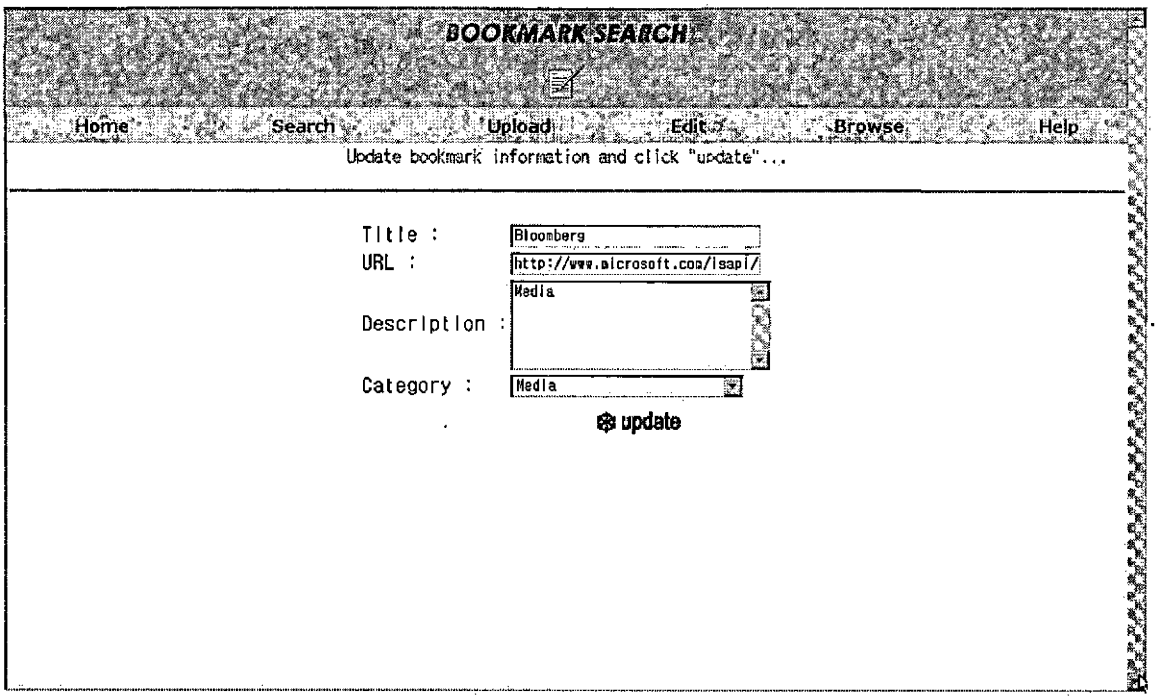
Figure 21. Bookmarks Update Site



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).

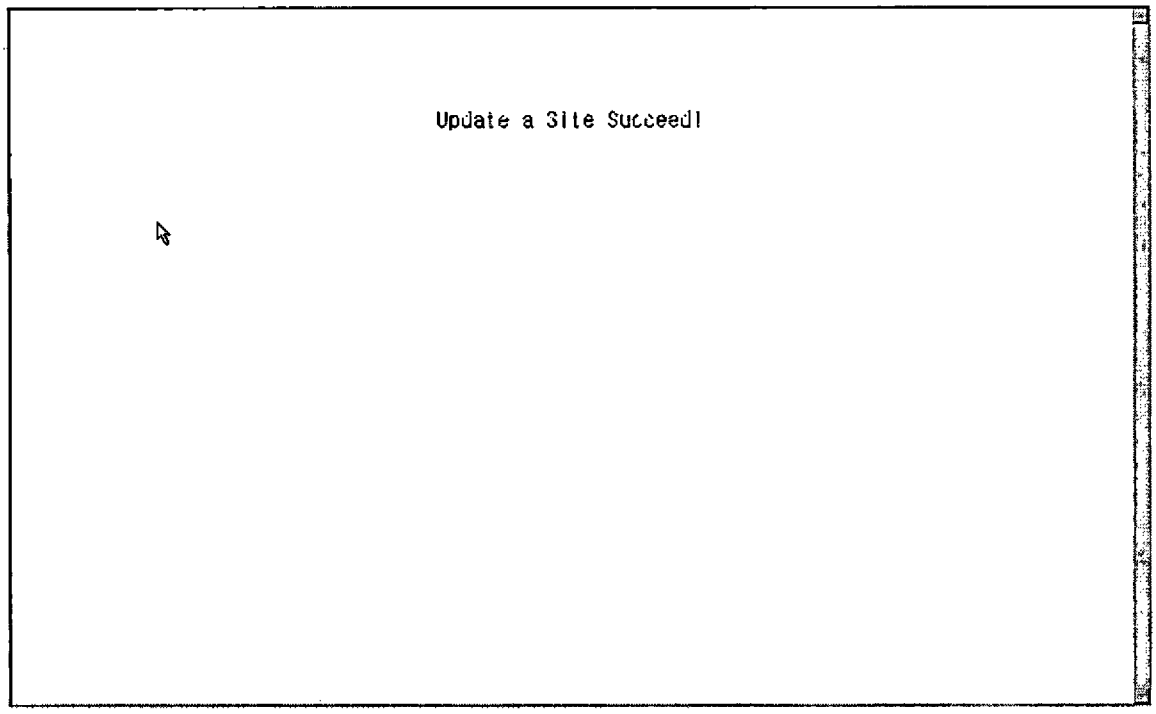
Figure 22. Bookmarks Update Box



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

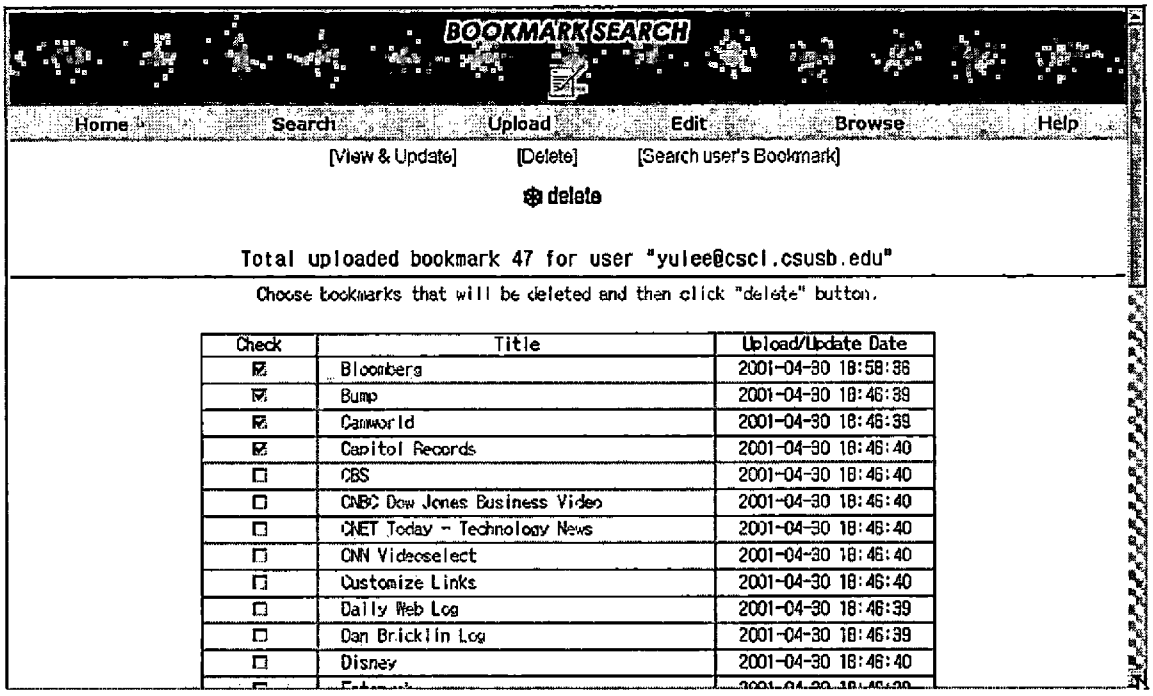


1.5.24 Bookmarks Delete Site

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).

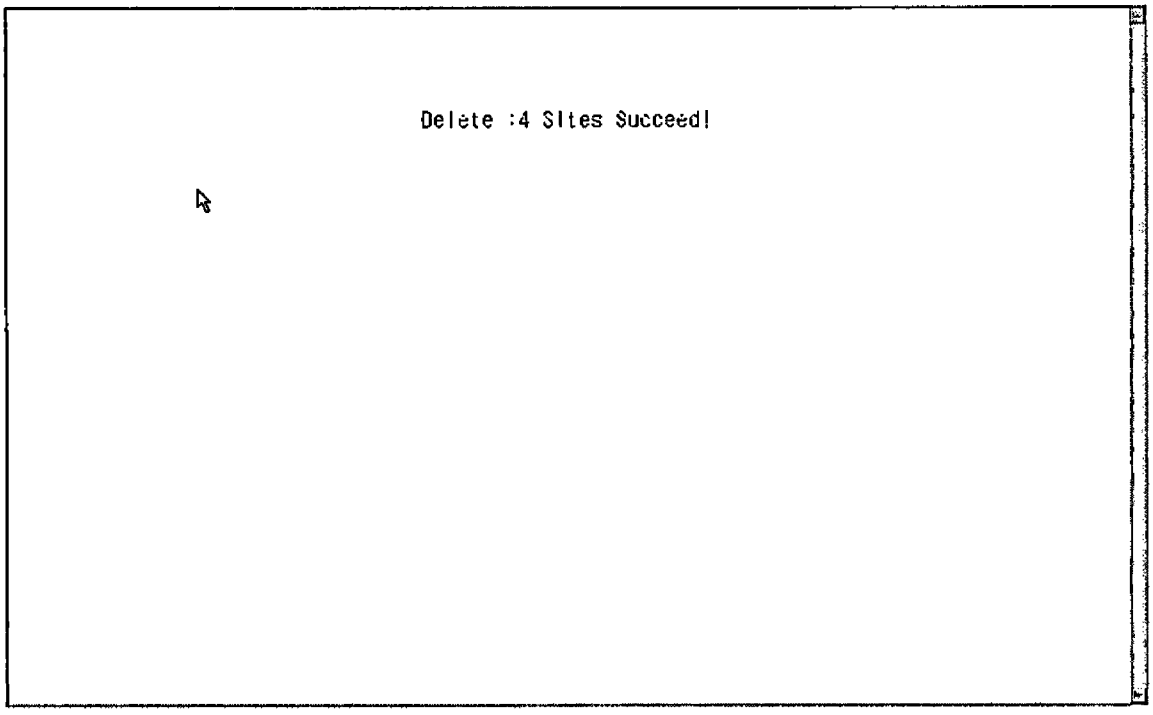
Figure 24. Bookmarks Delete Site



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

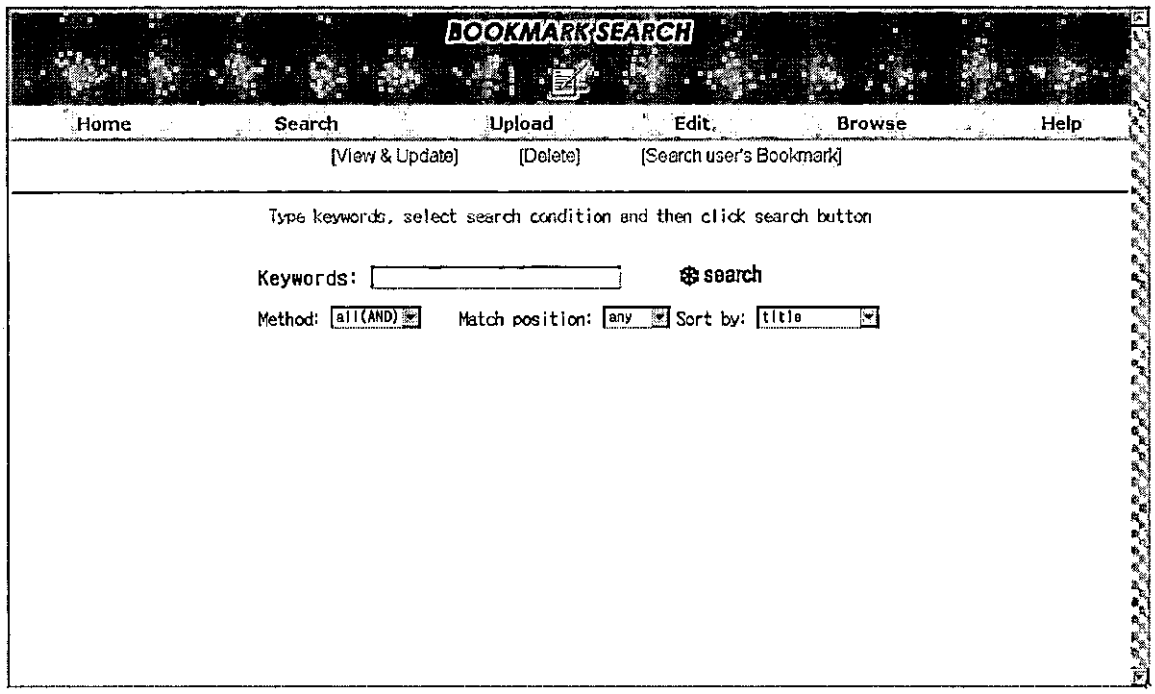


1.5.26 Search User's Bookmarks

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).

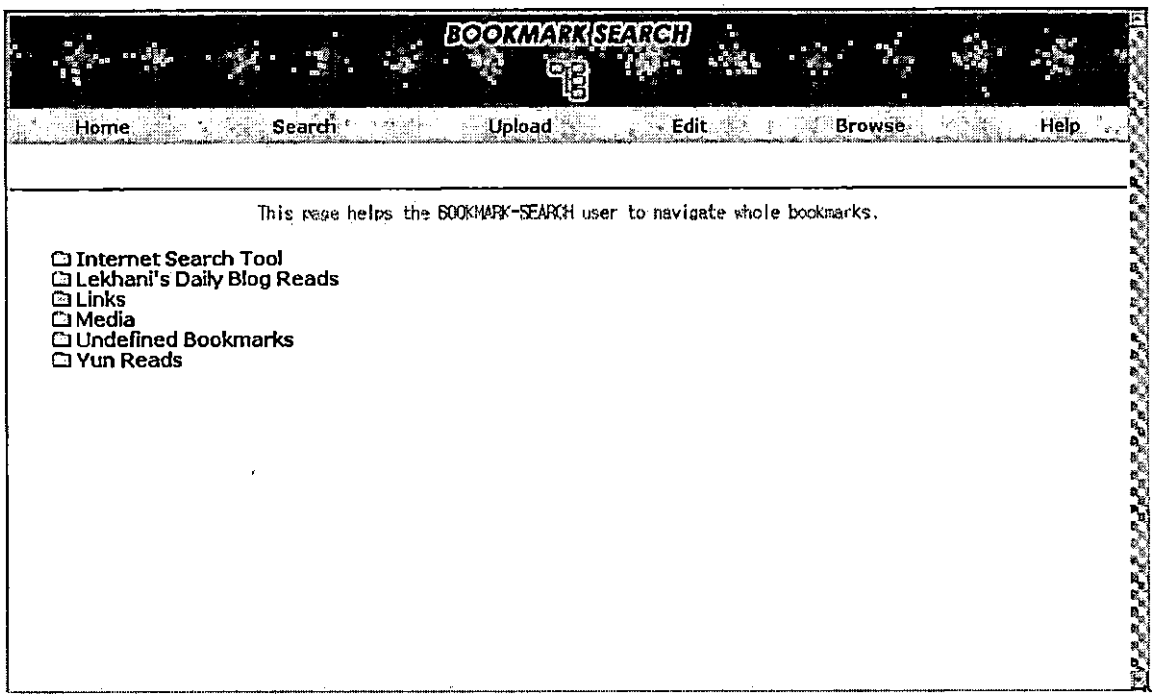
Figure 26. Search User's Bookmarks



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).

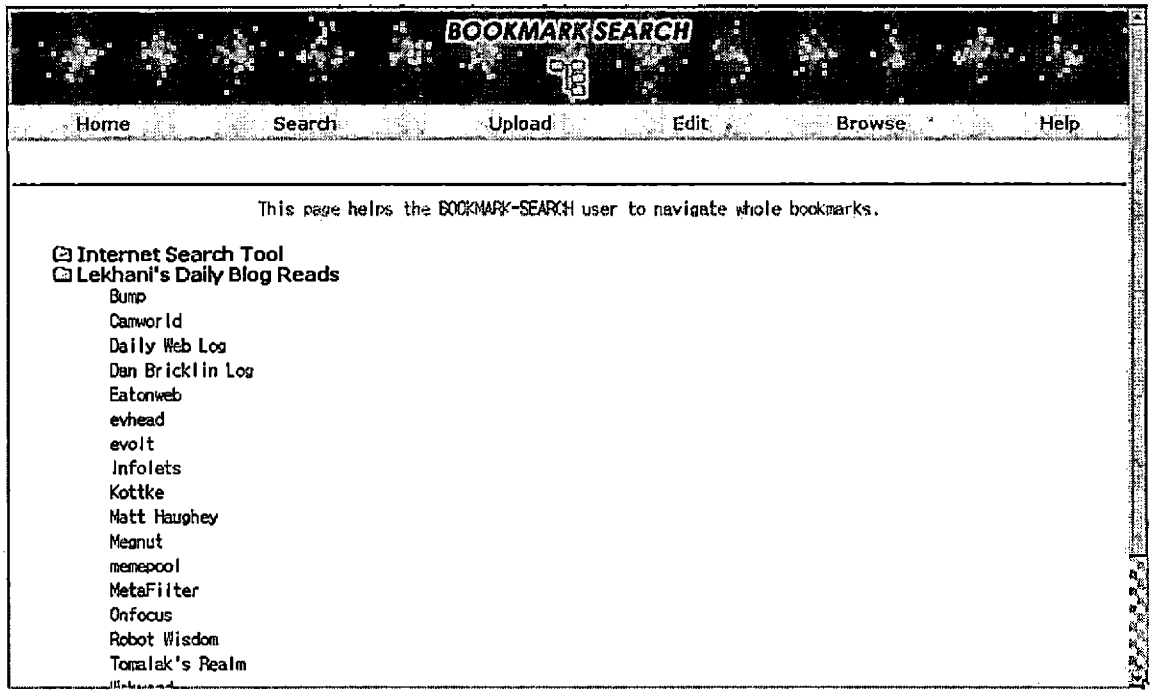
Figure 27. Browse Category



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).

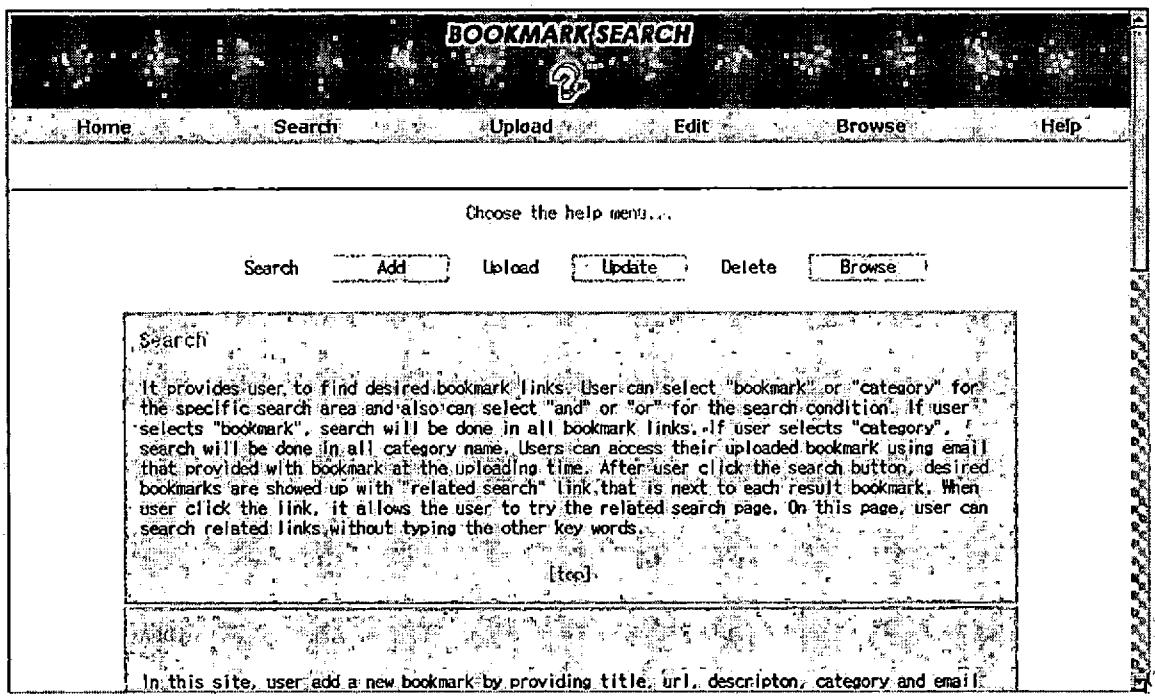
Figure 28. Browse Bookmarks List



1.5.29 Help

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



1.5.30 Validation

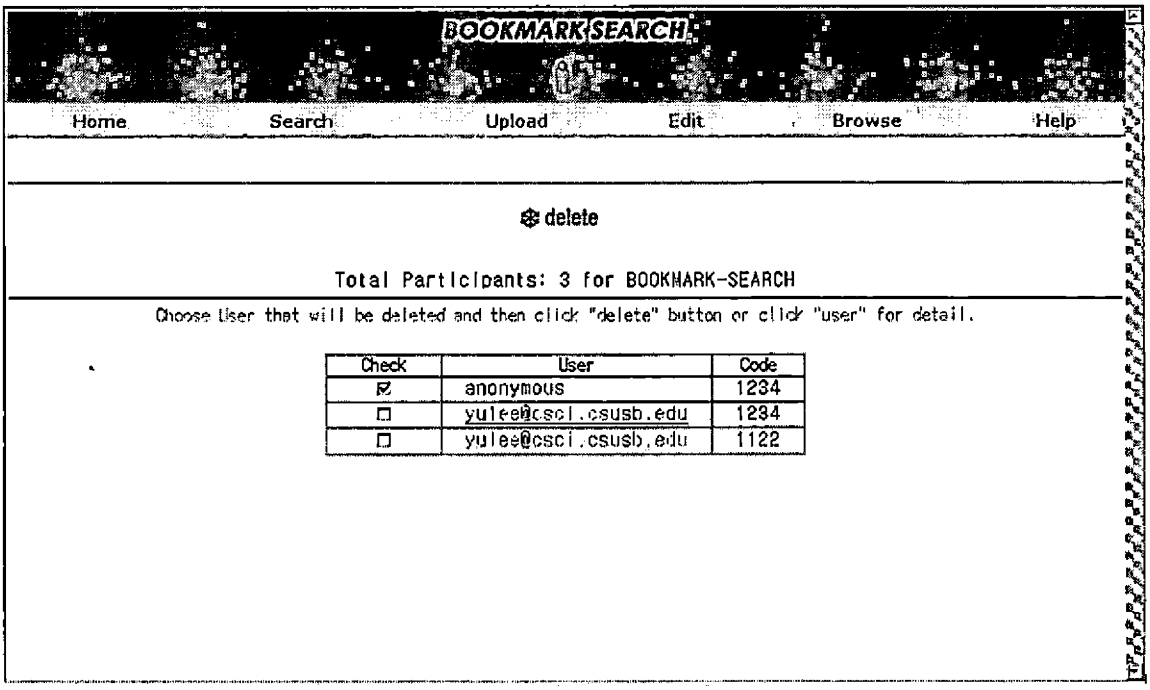
This message box will show up on the screen, when users try to submit information without fill out required boxes (Figure 30).

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).

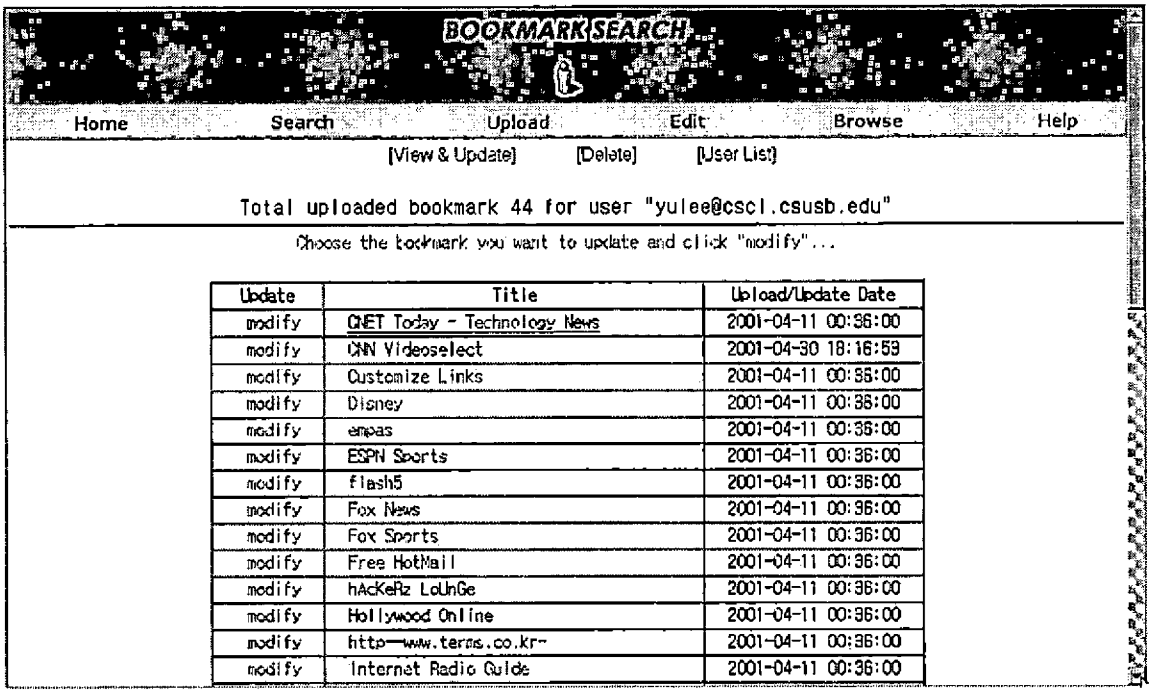
Figure 31. Administrator View



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).

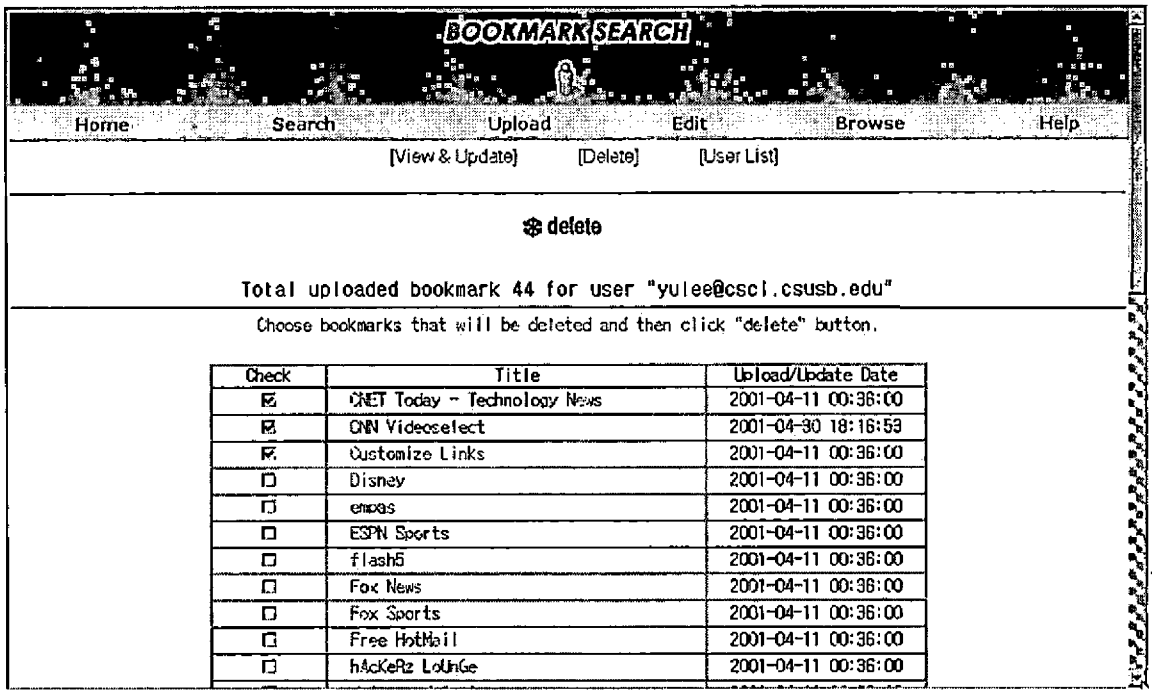
Figure 32. View and Update in Administrator



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

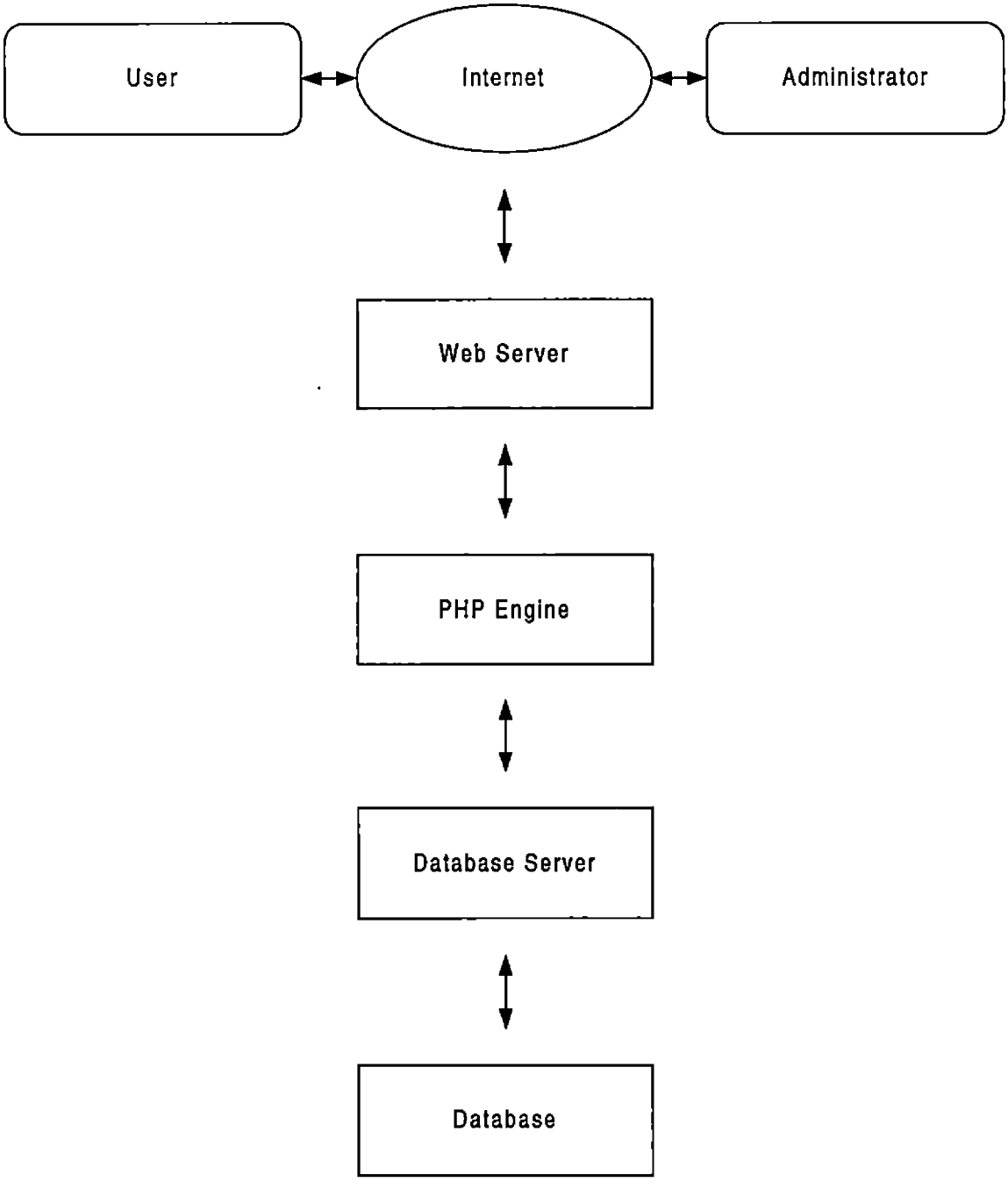


1.6 Functional Requirements

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

1.6.1 Overall Schema

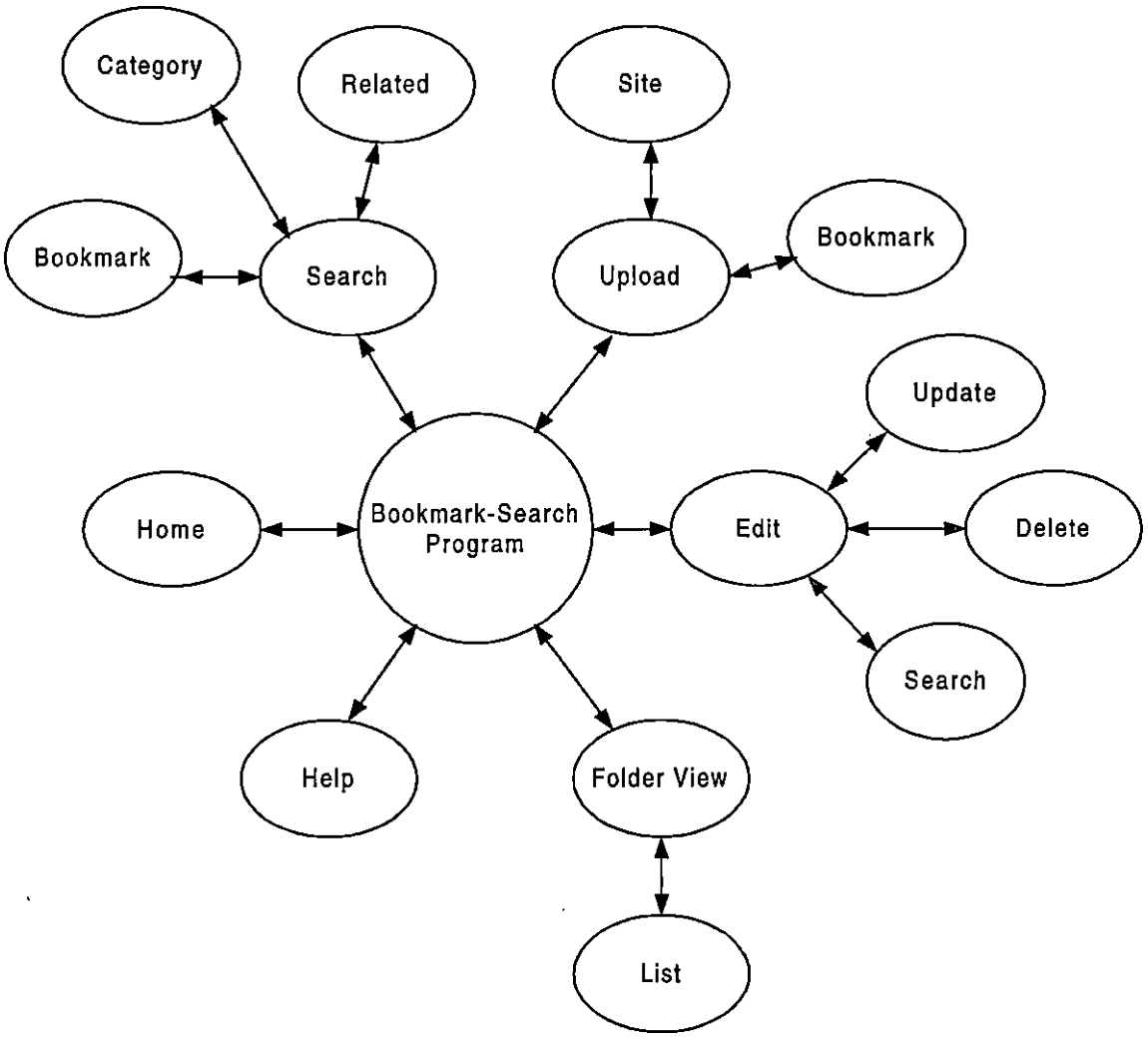
Figure 34. Overall Schema



1.6.2 State Diagram

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

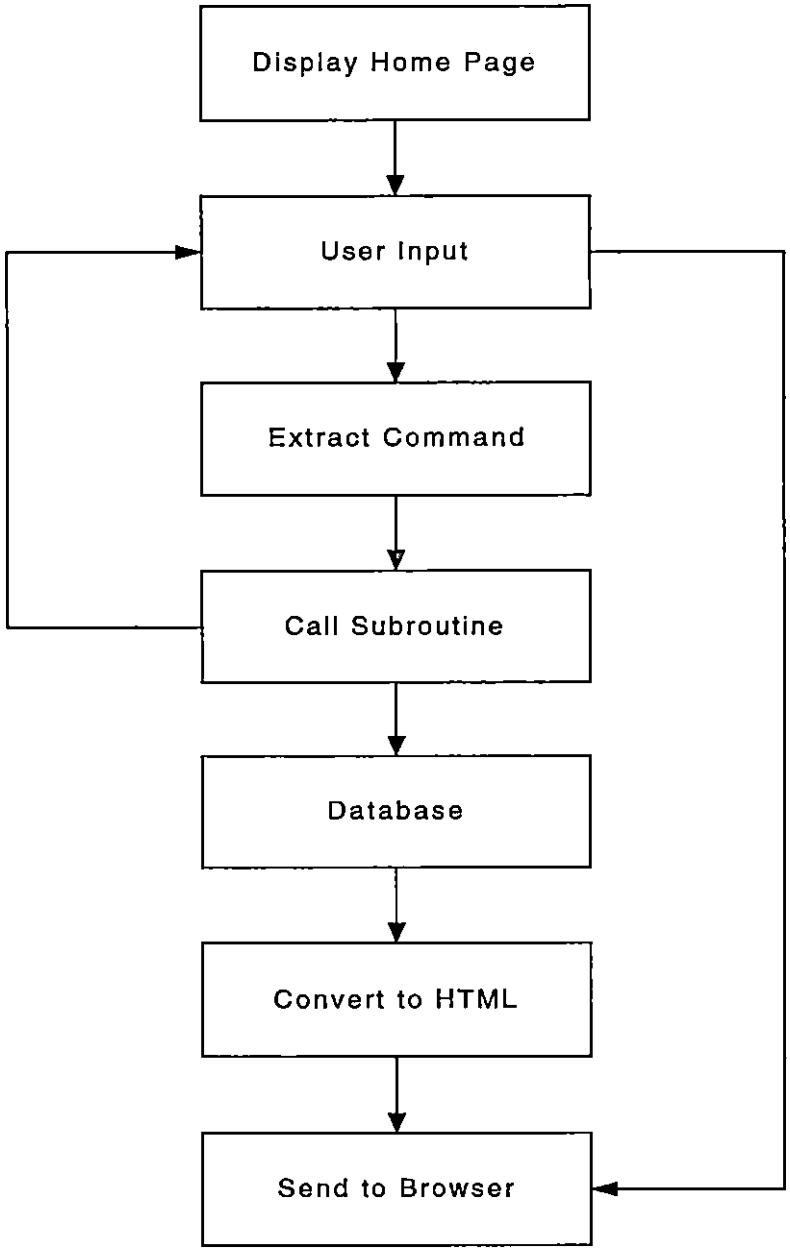
Figure 35. Bookmark-Search State Diagram



1.6.3 Bookmark-Search Algorithm

The following is a algorithm of the Bookmark-Search.

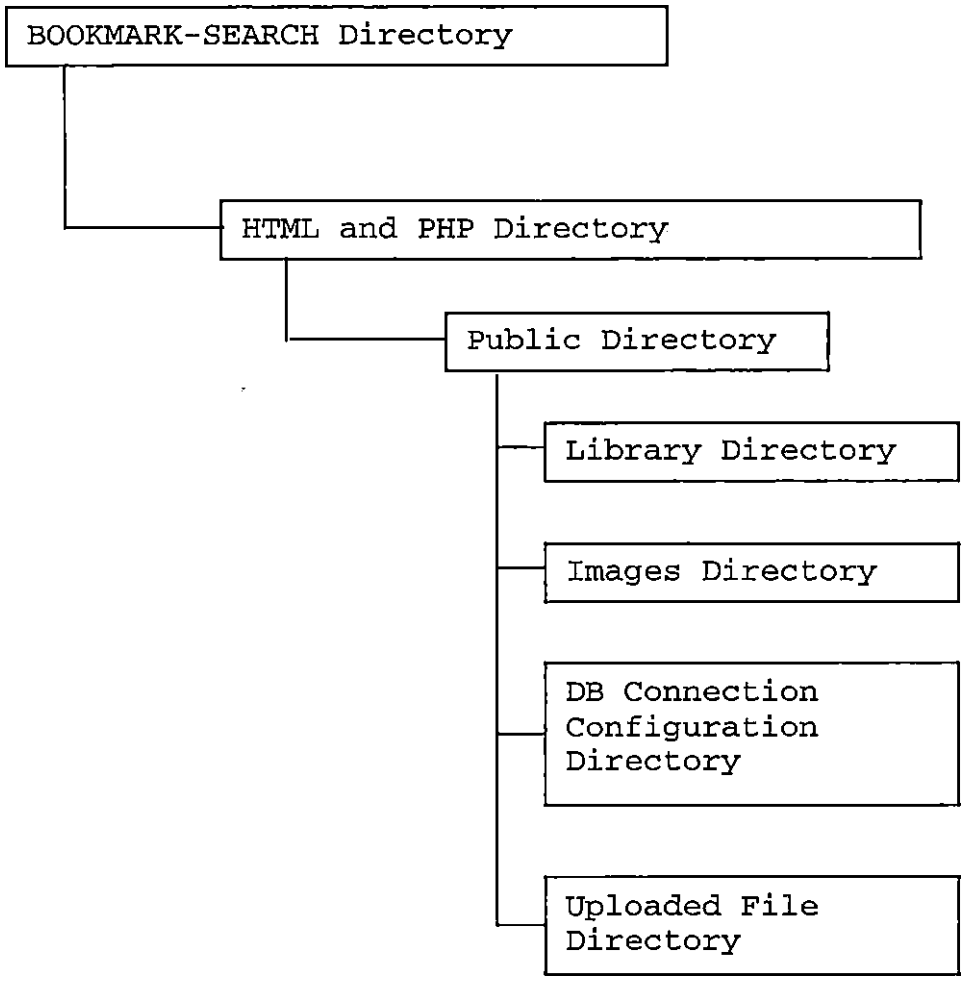
Figure 36. Bookmark-Search Algorithm



1.6.4 Directory Structure

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

Figure 37. Directory Structure

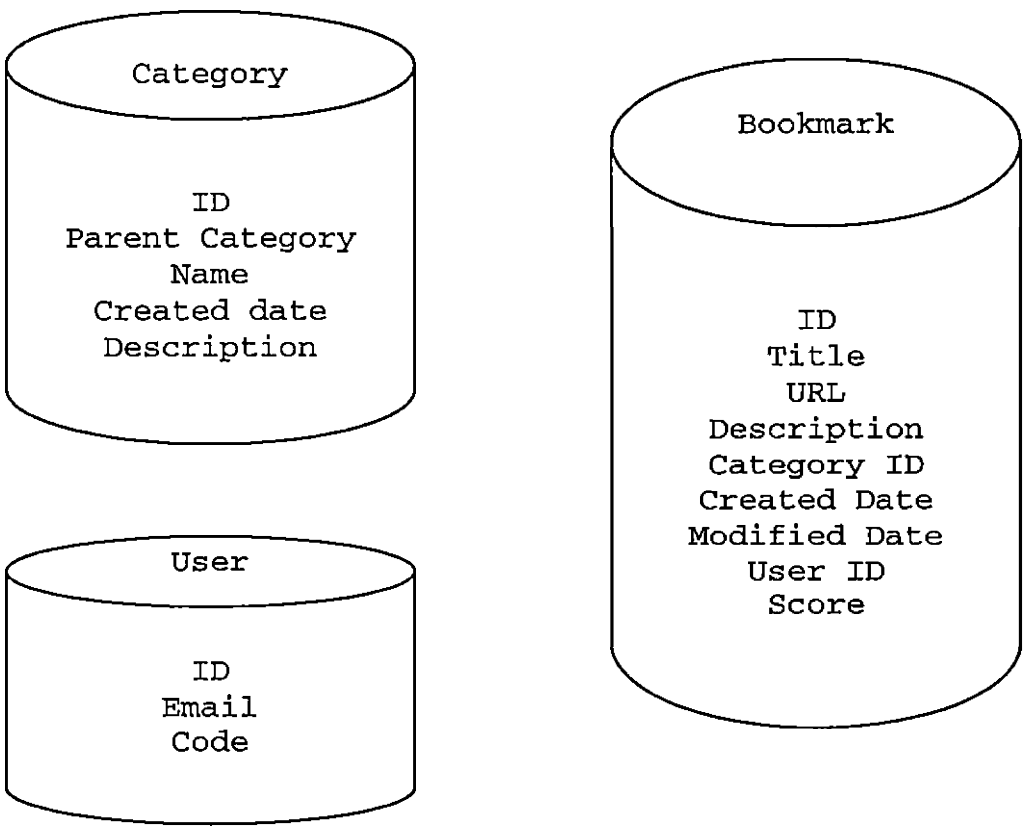


1.6.5 Database Design

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

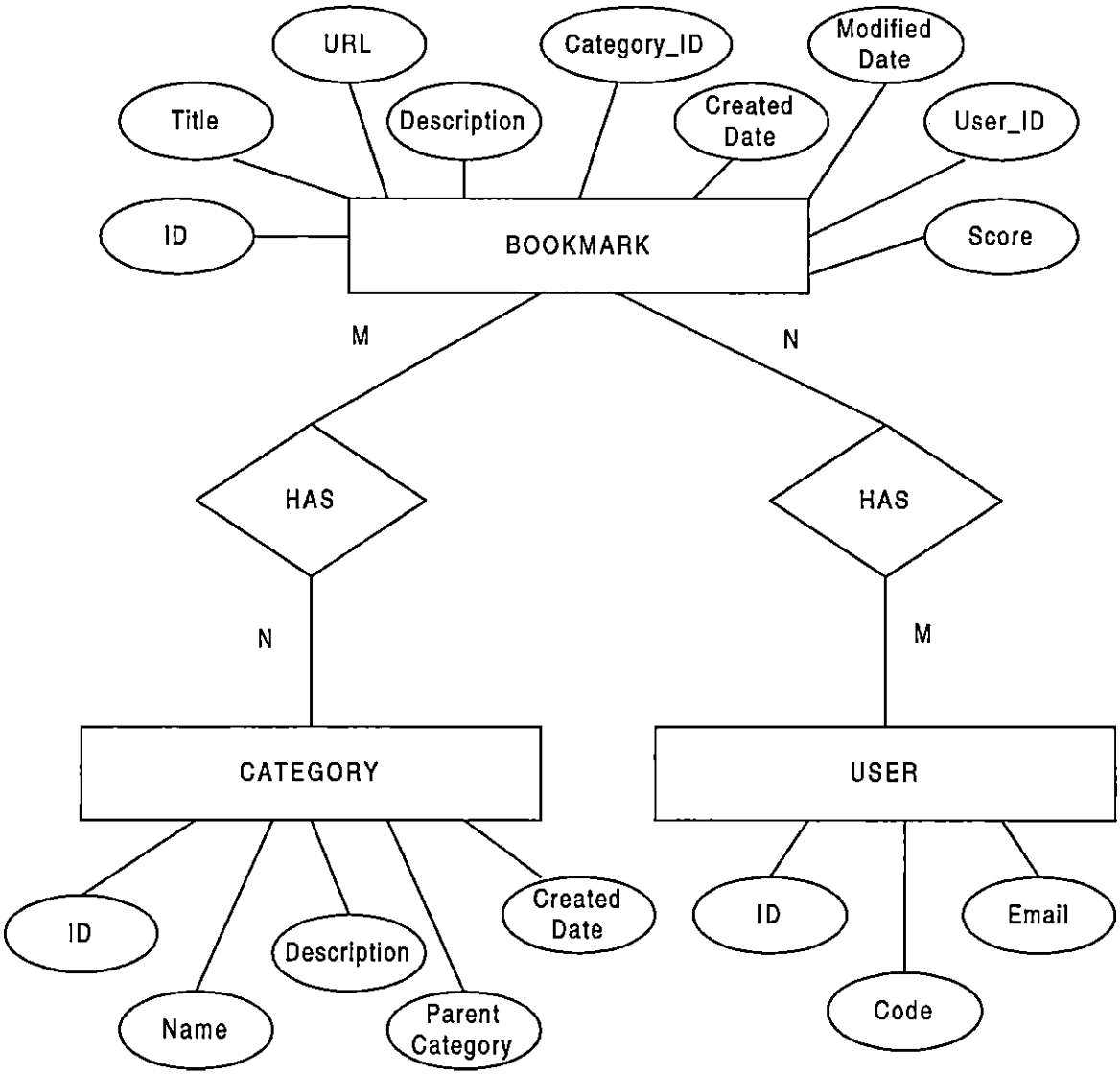
1.6.5.1 Conceptual Model Diagram.

Figure 38. Conceptual Model Diagram



1.6.5.2 Entity Relationship Diagram.

Figure 39. Entity Relationship Diagram



1.6.5.3 Logical Model Table Schema. 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)

Table 4. Database Table: Bookmark

ID	Title	URL	Description	Category ID	Created Date	Modified Date	User ID	Score
1	Yahoo	http://www.yahoo.com	Most famous search engine	1	1999-8-12	2000-5-13	1	4
2	Altavista	http://www.altavista.com	Most famous search engine	1	1999-2-10	1999-2-10	12	3
3	Yourhome	http://www.home.net	Home maintain guide	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 Name	Creation Date	Description
100	101	Internet	04302001	Internet
101	101	Computer and Information	04222001	IT
102	101	Networking	03122001	Network

1.6.5.4 SQL Commands. 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

1. 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 auto-browsing function, it can be modified to run with JavaApplet.
2. 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	X
Related Search	Tested for display more related links in DB	X
Add New Bookmark	Tested for insert into new bookmarks values in DB	X
Browse Bookmarks File	Tested to verify browsing function	X
Netscape's Bookmarks Upload	Tested for upload a bookmarks file to the server	X
Internet Explorer's Favorites Export	Tested for convert favorites directory to a bookmarks file	X
Internet Explorer's Favorites Upload	Tested for upload a converted favorites file to the server	X
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 User	Click the Home link	Display BOOKMARK-SEARCH Home page	X
	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

1.12 Glossary of Terms

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
          Extract 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
        If   Keywords are not exist
             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	Search
Purpose	Conduct Search in Category
Subitems	
Note	

```
    Procedure SearchCat
    Begin
        Extract Keywords
        Extract Search Conditions
        If   Keywords are not exist
             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	SearchReference
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
    End
```

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	BookmarkCreate
Where Used	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	Code Validation
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
               Extract Command
          Else
               Display Menu Page
          End If
     End
```

23.Function Name	EditUpdate
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	ModifySite
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 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	EditDelete
Where Used	EditMenu
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	TreeCategory
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
Where Used	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	Admin
Where Used	BOOKMARK-SEARCH
Purpose	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
```

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