Database using Personal Information Management System

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Abstract

In this paper we propose Personal Information Management System for Library Database. It manages personal search pattern for the given user and provide specific book list for library book search system. With the proposed system, the conventional overlap searching time will be decreased with personalized information and search history. This system manages the individual data according to personal searching pattern, sequence and usability. Therefore, the user can locate necessary book information more accurately with their distinct interest and search history.

Key Words : Library Database, Personal information management

1. Introduction

Most of the library book search system lists searched books without user's discretion. Even though the existing book search system include the key-word that user wants, the users are flooded with unnecessary information and spend more time to locate the books they actually want. If the library book finding system can recognize the specific interest of the user, then the search time and the list can be reduced and be more accurate. In this paper, we propose a system that manages individual user's search list such as books at discretion. This system can classify and arrange the book list according to the accumulated user's pattern. This will decrease the user's search time and enhance the quality of listed books.

The proposed system is essentially a personalized search system. Even for the same query, the system lists different lists according to the user's search history. Initially the system will show the same book list on the same query. After users select different books or papers, it will analyze the preference of the users and according to this preference, it will eventually show different list of search results. Unlike most of the previously library book search system, the proposed method can be applied to various general search system once the system is equipped with category tree. This paper consists of the following. In chapter 2, we will discuss some of the previous researches on personalized library search engine. Chapter 3 will explains the proposed system in detail and chapter 4 will follow with the simulated system. Finally chapter 5 will conclude.

2. Previous Research

UpLib (Universal Personal Digital Library System) was proposed by William C. Janssen, and Kris Popat [1]. It consists of a full-text indexed repository accessed through an active agent via a Web interface. It can handle any document format which can be rendered as pages. Provision is made for alternative representations existing alongside the text-domain and image-domain representation, either of which can be stored or generated on demand. The system is highly extensible through user scripting, and is intended to be used as a platform for further work in document engineering. UpLib is assembled largely from open-source components except for the OCR engine, which is currently proprietary.

Xian Fan, Fang Sheng, Gary Thomas, and Peter A.NG proposed personal Intelligent Document and Information Management System [2]. It provides various functional capabilities of collecting, classifying, filing, storing, retrieving, and reproducing documents, as well as extracting, browsing, retrieving and synthesizing information from a variety of documents. It consists of a document collection agent, a document classification collecting agent, a document classification component, a document extraction component, a document filing component, a document browsing and retrieval component, a document evaluation engine and a knowledge base.

Haystack (per-user Information Environments) was proposed by Eytan Adar, David Karger, and Lynn Andrea Stein [3]. It draws together some of the threads that have been explored separately in information retrieval and information filtering. For example, Haystacks might give completely different answers to two different individuals' queries, and be right because the two users mean different things. The fact that the system is explicitly designed to deal with queries creates an alternative to filtering systems' model of a "notification" service, instead allowing

useful processing of a users specific information needed at the time it become apparent.

Soyoung Lee and Young-Mee Chung proposed an expanded model of personalized search based on community activities on a Korean web portal [4]. The model is composed of defining subject categories of users, providing personalized search results, and recommending additional subject categories and queries. In the experiment of using log-data of Korean portal site, their personalized search service increases user's satisfaction better than nomal search service.

Most of the previous systems acquire the necessary user information from the users themselves more or less. If they are not able to provide the accurate information about themselves, then the system will not perform the desired task properly. Hence the system's performance is much dependent on the user's cooperation to the system, which is a formidable task. The unconscious interface from the user is preferable in this case.

3. The Proposed System

The proposed system particularly emphasizes the personal accumulated information. Initially all the same queries from different users will result in the same results. As the system performs the given queries, it will analyze and accumulate the user search patterns. According to the patterns, the different users with the same queries will be given the different results. In other words, the search engine individually manages the user's accumulated pattern data. The system continually updates the user's accumulated pattern data according to the user's demands, and records them on history base. On the basis of accumulated information, this system returns user the necessary information on the system environment as shown in Figure 1.
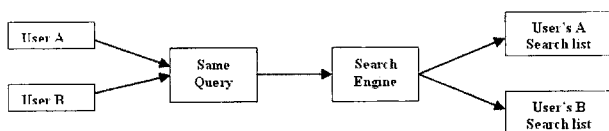

Fig. 1 The personalized search scenario

The prototype for the PIMS consists of a search engine, a displayed list, and a history base according to the system environment as in Figure 2.
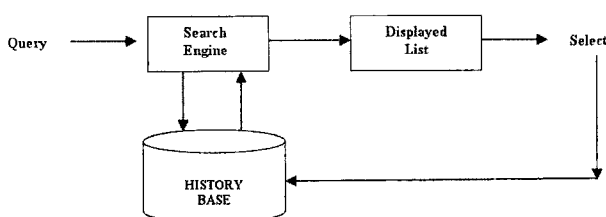

Fig. 2 The Architecture of the proposed system

The individual data base will be updated as following. Initially the data base is empty. As the user selects particular books from the given search list for a key word, the data base is modified accordingly. The library system will have a hierarchical structure of book list, which designed according to the book classification. As the user selects specific books from the search list, the user's personal interest list will be modified accordingly. For a broad search key word, the narrowed list will be concatenated and used for the refined search key. Therefore, as the system accumulated the user's pattern, the search key becomes more specific for general search. After the system receives enough information, the system can produce the different book list for different users from the same key word.

4. Simulation

The simulation shows how two users can be given the different lists for the same key word as they have the different access patterns. Assume that both User A and User B are interest in the field of the Multimedia. The User A wants books on Web design, whereas User B does Web program. The proposed system analyzes and stores both of the registered users' access history, such as what kinds of books are selected for borrowing. It also stores the useful information on interest subject from the book list category tree shown in Figure 3. The simulation results is shown in Table 1, where the users' search key words and the searched book lists as well as what the users have selected is displayed. As they access the system more and more, their information is more personalized. We assume that User A and User B continually enter the key-word at the same time, with the sequence of 'Multimedia', 'Web', '3D', and then 'Multimedia' again.

Initially, User A selects 'Illustrator' on displayed book and User B chooses 'PHP'. At the next time, User A selects 'Flash' and User B chooses 'XML'. At the third time, User A selects '3D Studio MAX', User B chooses 'Direct X'. At this point, initial system stored pattern information which is analyzed user's query. Finally, when both User A and User B type 'Multimedia' key-word, system displays different results according to the previously typed patterns.

As their personal pattern is accumulated by the selected book lists, the system displays the list representing the user's interesting field according to the selected books.

Table 1. The User A and User B's accumulated pattern data

Se- que nce	User A			User B		
	Keyword	Displayed Book	Selected Book	Keyword	Displayed Book	Selected Book
1	Multi- media	Illustrator	Illustrator	Multi- media	Illustrator	PHP
		Photoshop			Photoshop	
		PHP	Photoshop		PHP	ASP
		ASP			ASP	
2	Web	Flash	Flash	Web	Flash	XML
		Dreamweaver			Dreamweaver	
		XML	Dream- weaver		XML	JAVA
		JAVA			JAVA	
3	3D	3D studio MAX	3D studio MAX	3D	3D studio MAX	DirectX
		Maya			Maya	
		DirectX	Maya		DirectX	Open GL
		Open GL			Open GL	
4	Multi- media	Digital Color	Digital Color	Multi- media	Web Applica- tion	Web Appli- cation
		Font Design			Visual Pro- gram	
		Web Site Design	Font Design		Java Applet	Visual Pro- gram
		Visual Flash			Java Technol- ogy	

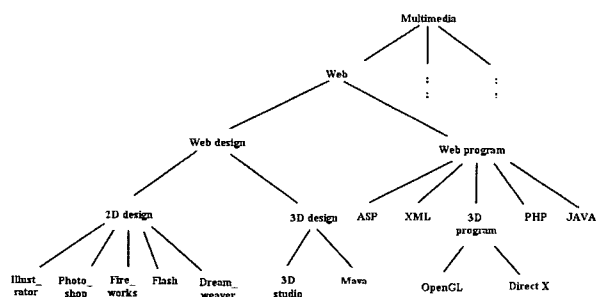

Fig. 3 The book list category tree

5. Conclusion

In this paper, we proposed a system that can manage user's interest patterns and list the searched list according to the user's pattern and interest. We have described the design, implement, architecture, and processing of the system. The simulation results show that the system learns the user sequences and manages the personal pattern accordingly. It will offer fast access to search information for users with different interests, by making a certain special pattern in data base for efficiency of personal list management.

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