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Optimizing User Experience While Interacting with IR Systems in Big Data Environments

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Abstract

In the user-centered design paradigm, information systems are created entirely tailored to the users who will use them. When the functions of a complex system meet a simple user interface, users can use the system conveniently. While web personalization services are emerging as a major trend in portal services, portal companies are competing for a second service, such as introducing 'integrated communication platforms'. Until now, the role of the portal has been content and search, but this time, the goal is to create and provide the personalized services that users want through a single platform. Personalization service is a login-based cloud computing service. It has the characteristic of being able to enjoy the same experience at any time in any space with internet access. Personalized web services like this have the advantage of attracting highly loyal users, making them a new service trend that portal companies are paying attention to. Researchers spend a lot of time collecting research-related information by accessing multiple information sources. There is a need to automatically build interest information profiles for each researcher based on personal presentation materials (papers, research projects, patents). There is a need to provide an advanced customized information service that regularly provides the latest information matched with various information sources. Continuous modification and supplementation of each researcher's information profile of interest is the most important factor in increasing suitability when searching for information. As researchers' interest in unstructured information such as technology markets and research trends is gradually increasing from standardized academic information such as patents, it is necessary to expand information sources such as cutting-edge technology markets and research trends. Through this, it is possible to shorten the time required to search and obtain the latest information for research purposes. The interest information profile for each researcher that has already been established can be used in the future to determine the degree of relationship between researchers and to build a database. If this customized information service continues to be provided, it will be useful for research activities.

Keywords: Big Data, Personalized Information System, Web, STEAM

1. Introduction

In the user-centered design paradigm, information systems are created entirely tailored to the users who will use them. When the functions of a complex system meet a simple user interface, users can use the system conveniently. While web personalization services are emerging as a major trend in portal services, portal

companies are competing for a second service, such as introducing 'integrated communication platforms'. Until now, the role of the portal has been content and search, but this time, the goal is to create and provide the personalized services that users want through a single platform. Personalization service is a login-based cloud computing service. It has the characteristic of being able to enjoy the same experience at any time in any space with internet access. Personalized web services like this have the advantage of attracting highly loyal users, making them a new service trend that portal companies are paying attention to.

The reason the portal industry first considers web personalization services as the next-generation growth engine is because it can secure search use and highly loyal customers. To put it simply, web personalization is a service that processes all tasks performed on a PC and the Internet at once on a portal site. We can view emails from other sites on one portal site and enjoy the communities of other sites. In addition, you can save documents or videos on the web as if you were saving them on a PC, and you can also create documents on the web as if you were using an office program. The concept of creating another PC and your own homepage on the web. Accordingly, if a user uses the personalized service of one portal site, there is no need to move to another site.

The technologies in the information technology industry that will dominate the next 10 years are: real time, personalization, social network, and geo-local. The core value of the future web is social, and web services are divided into information service and network service. Social network services not only have the effect of distributing content to a large number of people, but they also sometimes make up for the shortcomings of search engines and expand the contact points of content. In the future, network services that connect people are expected to have much greater value than information services that collect data. This paper discusses the major personalized services of ScienceDirect, SciVerse Hub, which are information provision platforms for science and technology publishers, ProQuest and Google, which are meta information provision platforms, and DBpia, a domestic academic information provider. The purpose of this study is to understand current trends by analyzing the main funtions and characteristics of major personalization systems in the STEAM filed. Suggestions for the design of user-centered systems in data-intensive environments, are also discussed.

2. Personalized Information Systems in STEAM

ScienceDirect[1] provides My Settings and My alerts as personalization functions in the menu. Customizing is required to use the personalization features provided by ScienceDirect. If you register and log in to ScienceDirect, you can use various customizing functions that can save time and effort when using ScienceDirect. You can save search terms and search history, and view a list of recent search results. You can set your favorite pages and sites as quick links. Users can specify their desired environment. You can choose how to receive search results and notification services in MySetting on the menu bar. You can receive notification services about search results by email or RSS using saved search terms or according to recently performed search terms. Search results are only stored for 30 days. You can configure whether you want to receive it by email or RSS in My Settings. You can give a title to a specific search alert. You can receive search alert services on a daily, weekly, or monthly basis. The email receiving the notification service will display the value entered in the personal information settings by default. You can edit this to a different email if you wish.

When you set up a search alert, the message 'Your Alert was saved as: patent citation' is displayed, indicating that the alert has been successfully set up.

Whenever there is a paper matching the selected topic, you can receive it by email or RSS. ScienceDirect has hundreds of topics set up. Among these, you can use the Topic Alert service. You can select one of several RSS feeds and receive immediate updates whenever new data is available on ScienceDirect. You can set

favorites by clicking Add to Favorite on the journal or book page. When you click Add to Favorites, it changes to 'Added to Favorites [remove]'. It memorizes up to 100 recently visited pages or search terms. You can discover what researchers are reading and track the latest trends with the Top 25 Hottest Article notification service provided free of charge by ScienceDirect. When you select a journal belonging to a subject field provided in ScienceDirect's menu bar, the 25 most popular papers during a specific period are listed on the right. It shows the number of citations in Scopus for each article. This is a free service that provides a list of the 25 most read papers by researchers, measured by the number of papers downloaded through ScienceDirect.

ScienceDirect provides more than 2,000 journals, and you can also view the top 25 papers by journal or subject area. ScienceDirect offers 24 core subject areas. You can read the original text of the paper by clicking on one of the top 25 papers. If you do not have permission to view the original text, you can purchase the original text using a credit card. You can receive the top 25 papers free of charge every quarter through a notification service. After registering as a user, you can select the desired subject area or journal and receive the notification service.

Figure 1. ScienceDirect Home Page

SciVerse Hub[2] provides two personalization features in the menu: My Settings and My Applications. My

Settings provide the Modify Personal Details and manage applications and Change Password menus. In My Applications, SciVerse Hub provides My WorkFlow Search, Methods Search, and ScienceDirect Top 25. Myexperiment is a web page that shares the results (series of experiment processes) of a workflow design tool called Taverna. Taverna is the most popular web service workflow design tool and is freely available under the GNU Lesser General Public License (LGPL) as part of the myGrid project funded by the Engineering and Physical Sciences Research Council (EPSRC). Myexperiment allows you to log in through OpenID and consists of five main menus: My, People, Projects, Workflows, and About. In the My menu, you can create and manage your profile, manage your friends, manage your registered workflows, and create and manage projects, forums, and blogs. In the Workflows menu, you can download along with diagrams of workflows uploaded by other people so you can run them right away through Taverna, while each workflow allows you to leave an introduction, diagram, tags, and comments about the workflow.
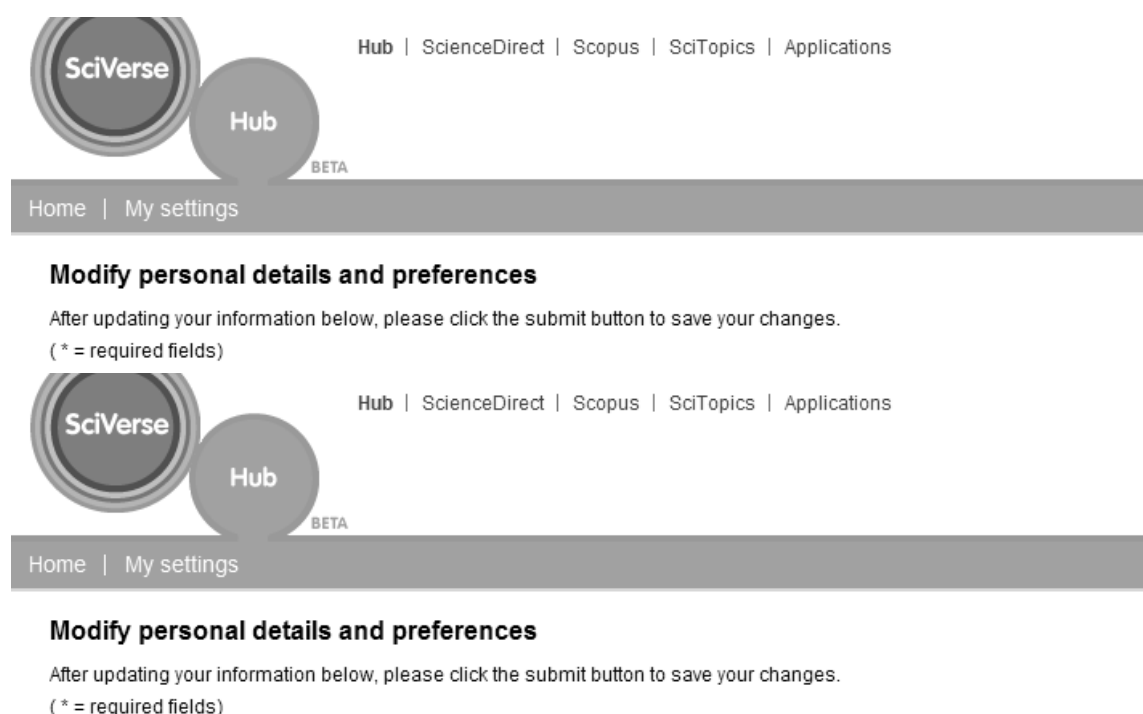
Hub | ScienceDirect | Scopus | SciTopics | Applications

SciVerse Hub BETA

Home | My settings

Modify personal details and preferences

After updating your information below, please click the submit button to save your changes.
(* = required fields)

Hub | ScienceDirect | Scopus | SciTopics | Applications

SciVerse Hub BETA

Home | My settings

Modify personal details and preferences

After updating your information below, please click the submit button to save your changes.
(* = required fields)

Figure 2. SciVerse's Personal Setting Page

Personalized services can be set up in ProQuest's[3] My Research. You can quickly set up alerts in My Research, and use the alert service via RSS or email. You can directly access notifications and search history, and set the search target environment by setting only the desired database list. You can also customize the search result format. You can also create Login Links that do not require IP verification. You can save useful papers and view detailed information using My Research provided by ProQuest. Bibliographic information of multiple papers can be printed, sent via email, or exported at once. You can search or link to papers to build a web page. My Research Summary shows all history of the current session. This history can be downloaded to a web page, emailed or edited. My Research Summary tab is divided into Marked Documents, Recent Searches, and Visited Publications. Marked Documents is a list of checked articles and provides hyperlinks and open

URLs to go directly to the original text. Recent Searches shows recently performed searches, and you can see a list of results by clicking on the search. You can view the journals you have entered and left using Visited Publication, and click on the journal name to go to the volume page. You can set up a notification service on the My Research page.

Figure 3. ProQuest's Personal Setting Page

Through Google's[4] web history, you can check and manage your web activity and get the most relevant search results. Additionally, users' web activity trends can be identified. The web history service itself is not much different from the browser's visit history, but if used together with Google's other services, it will likely be a useful function for personalization in the future. Web History allows you to directly view and search the full text of pages you have visited, including Google search history, web pages, images, videos, and news articles. You can also manage your web activity and remove unwanted items. You can delete it from your web history at any time. Web history provides enhanced customized search results based on searches made on Google and visited sites. You may not notice any significant difference in search results at the beginning of use, but as the period of web history use increases, you can see that the quality of search results gradually improves. Google began experimenting with its 'Preferred Sites' service in January 2009 for a personal customized search service. Preferred sites are based on 'history' searches. History search is a method that first shows the sites with the highest number of visitors among the sites searched so far. Preferred sites also provide a 'Help' function so that users can add or remove sites from search results. The user's preferred search form is stored in Google's 'Web Search Preference'. Based on this, Google shows customized search results that users may prefer the most when they enter a search term. Preferred sites can be seen as an extension of Google's 'SearchWiki', which uploads, deletes, adds, and annotates search results. These search services are tailored to the individual only when the user logs in online. Web history tells you about your web activity trends, including which sites you frequently visit and how much you searched during a specific period of time.

Among the many functions of DBPIA[5], including my DBPIA, the main screen setting is a function that allows you to place frequently used functions on the main screen as desired. The main screen setting function can only be used by registering and logging in to DBPIA as an individual member. Among the functions classified as main functions, additional functions, and personal information, you can easily use your own

customized screen by adding the functions you want to display on the main screen and then clicking the "Save Current Settings" button at the top of the tab. The personalization services provided by DBpia's My DBPIA are largely scrap management, my tag management, purchase history, point history, notification service, member information management, DBPIA search environment settings, and mobile reading papers. Scrap management is subdivided into paper scrap, volume/issue scrap, publication scrap, publishing organization scrap, and KRPIA scrap. Scrap management is a function that scrapes metadata such as publisher, publication, volume/issue, and thesis and stores and manages them in my DBPIA. Scraped information can be saved by creating a folder in my DBPIA, and additional functions such as downloading papers and exporting bibliographies can also be used. If you log in as an individual member and set the environment according to your desired conditions, it will be saved as member usage information, not as an internet cookie. You can use DBpia's academic papers in a saved environment anytime, anywhere.
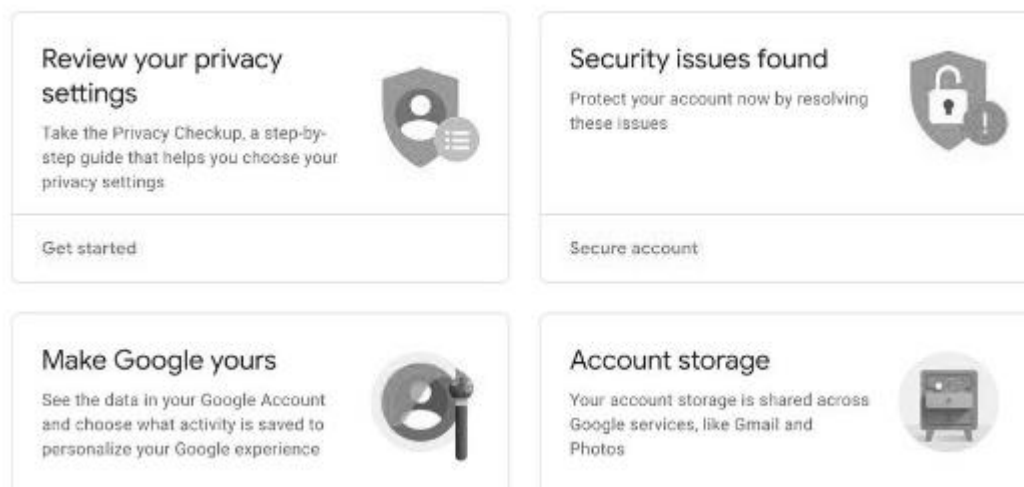

Figure 4. Google's Personal Setting Page

3. Discussion and Conclusion

Researchers spend a lot of time collecting research-related information by accessing multiple information sources. There is a need to automatically build interest information profiles for each researcher based on personal presentation materials (papers, research projects, patents). There is a need to provide an advanced customized information service that regularly provides the latest information matched with various information sources. Continuous modification and supplementation of each researcher's information profile of interest is the most important factor in increasing suitability when searching for information. As researchers' interest in unstructured information such as technology markets and research trends is gradually increasing from standardized academic information such as patents, it is necessary to expand information sources such as cutting-edge technology markets and research trends. Through this, it is possible to shorten the time required to search and obtain the latest information for research purposes. The interest information profile for each researcher that has already been established can be used in the future to determine the degree of relationship between researchers and to build a database. If this customized information service continues to be provided, it will be useful for research activities. Building and operating a successful information system begins with understanding users. In the process of building and operating an information system, priority should be given

to evaluating user-participatory systems from the user's perspective rather than the developer's perspective. In order to increase the efficiency of system use, continuous user testing must be established and consistent system evaluation must be conducted.

References

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