HotWindow System for Providing the Latest Information Using Information Visualization Technologies—Providing a "Trend Information Window" that Picks up Current Information from the Network World

NTT has developed "HotWindow", a system for providing the latest information based on information visualization technologies and ultrahigh-speed Webpage gathering and categorization technologies[*1] developed by NTT Cyber Solutions Laboratories (NTT-SL). It provides a GUI-based[*2] overlay display[*3] of vocabulary in which the user has expressed interest and vocabulary extracted and categorized from the latest Webpages that are created one after another in the network world. At the same time, it functions as a browser that seamlessly leads the user to related network contents. In this way, the system is able to express "topicality", in which the latest information from the network world is overlaid with the user's interests. Using this topicality, HotWindow achieves the concept of a "Trend information window" that arouses the user's curiosity (**Fig. 1**).

With the growth in the number of news sites and other sites that provide information in various specialized fields, this new system offers the potential for a wide range of applications for general users, such as keeping track of the latest topics on message boards or quickly grasping user needs and trends in auction items in the context of net auctions, for which information is being constantly updated. Companies can use the system as a marketing tool because it enables timely visualization of biases and shifts in needs for new products and services. The system could also be applied in a broad range of other fields; for example, Website managers and advertising providers can develop effective advertising by using the system as an analysis tool to gain a better understanding of the keywords that will offer the highest level of exposure in Internet searches.

NTT will provide the HotWindow service for a period of about six months from October 1 through NTT-SL's test service site "Cyber-Trial" (http://www.cyber-trial.com/) [1]. In addition to gathering comments and suggestions from trial users and verifying the usefulness and reliability of the technologies in an actual environment, the company will reflect results of the trial in research and development that will form the foundation of new services.

Background

The number of Internet users is steadily increasing, with some 55 million users in Japan alone, and more than 11 million broadband users (as of June 2003). People who were once simply receivers of information in the era when TV, radio, and other mass media were the mainstream have become transmitters of information in the network world, and as a result the volume of new information being transmitted is increasing dramatically. Under these circumstances, there have been cases in which the information did not reach the people that needed it in a timely fashion.

HotWindow acts as a window to provide the era's most advanced information by allowing users to access the latest information at any time simply by watching the HotWindow GUI, and by facilitating timely meetings between the users and the parties transmitting the information.

*1 Ultrahigh-speed Webpage gathering and categorization technologies quickly gather Web pages from large-capacity Web servers, and generate indexes quickly and easily. (Ref. "New-Information Search Engine": http://www.ntt.co.jp/news/news02e/0212/021203.html)

*2 GUI: A graphical user interface for displaying the output from a program on a computer screen.

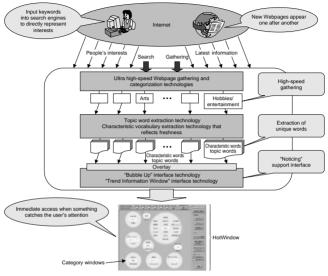*3 Overlay display: A GUI display that shows two or more types of information in a visual overlay pattern.

Fig. 1. How HotWindow works.

Key related technologies

HotWindow efficiently picks up current information from networks using the following two technologies.

(1) Characteristic vocabulary extraction technology that reflects freshness to acquire the latest information

NTT has developed techniques for extracting vocabulary that indicates freshness in order to acquire the latest information, thus enabling the user to efficiently allocate unique characteristics to categories and automatically extract the latest vocabulary. This is accomplished by using ultrahigh-speed Webpage gathering and categorization technologies to calculate the appearance frequency and appearance movement over time for vocabulary across multiple categories based on the latest Webpage information, which has been rapidly gathered and categorized. In this way, it is possible to gather and categorize vocabulary that expresses the newest information created in the network world in extremely short cycles (15 minutes to one hour).

(2) Technology for extracting topic vocabulary from words input during user searches

NTT has developed topic vocabulary extraction technology that automatically detects vocabulary representing current topics from among the terms input during user searches by combining a high-speed ranking generator technique that quickly tabulates the words input during searches over the past few hours, and a rapidly increasing vocabulary detection technique that analyzes changes in

ranking over time and extracts vocabulary that expresses rapidly increasing user needs. In this way, it is possible to achieve a close-up image of the type of information that users want "right now."

Then two more technologies are used for the GUI to visualize the user needs and latest information gathered using the techniques described above.

(3) "Trend Information Window" interface to help users notice trends and activities in the world around them

This puts small round windows (category windows) representing separate categories on a PC screen, enabling the user to constantly monitor the types of vocabulary that are created in each category. The words input into search engines by the user are also overlaid in the category windows, and these words are displayed with characters of various sizes according to the user's degree of interest. The lifecycle of information in the network world can vary dramatically, with information changing every few hours, every few days, or in some cases even longer, so it can be difficult to understand changes in information simply through displays of the newest information. The "Trend Information Window" interface enables users to "play back" the status of the window from a few hours in the past up to the present at any time using a continuous regeneration interface that displays the changes in the vocabulary that represents the latest information in an easy-to-understand format.

In this way, the system displays new information and user needs in a timely, easy-to-understand manner, thus effectively helping the user to notice key information.

(4) "Bubble Up" interface to achieve focus + context[*4]

Interfaces that can minimize superfluous operations to gather information quickly and easily are essential to the process of guiding users from simply "noticing" new information to effectively gathering it. If normal Webpage GUIs are used for this purpose, the pages change each time detailed information for the category is displayed. This not only makes it difficult to get an overall view of the category, but also requires a large number of user operations; for example, the user often has to return to previous pages or close unwanted windows that have opened. To resolve these issues, NTT has developed a "Bubble Up" interface that eliminates page switching when detailed information is displayed, and enables the user to view detailed information as it is stored—in a list format for all categories—without losing the opportunity to notice information of interest. This interface displays text in category windows that rise up the screen.

The system also leads the user to related Web contents—all the user needs to do is click on one of the user search words or new information words that are displayed in the category information window.

In this way, users are instantly guided to related contents, where they can come in contact with the latest information and never miss an opportunity to say, "I wonder what this is?"

How to use "Cyber Trial"

Anybody can use "Cyber Trial" by accessing the top page and registering as a user. For details on procedures and the system environment required to use HotWindow, please refer to the HotWindow manual on the trial site at: http://www.cyber-trial.com/hotwindow/index.html (in Japanese)

Future plans

NTT will continue its research and development with the goal of providing a fully functioning version of HotWindow to all users. We will gather an even broader range of constantly expanding network information, promote research and development that will form the foundations of more convenient and enjoyable services, and collaborate with the many companies in the NTT Group to develop new services that incorporate the technologies offered by these companies.

Reference

[1] "KiriBariWeb: a Tool for Easily Constructing Personal Portals—Trial Service Begins at "Cyber Trial" Site," NTT Technical Review, Vol. 1, No. 4, pp. 69-70, 2003.

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*4 Focus + context: On a regular GUI, outline information is lost when the display is switched from outline information to detailed information, either by changing pages or zooming in. "Focus + Context" refers to an interface design approach that enables detailed displays while maintaining an outline display to some degree.

For further information, please contact
NTT Cyber Solutions Laboratories
Yokosuka-shi, 239-0847 Japan
E-mail: ckoho@lab.ntt.co.jp