Chapter 3
A Fresh Look at Graphical Web Browser Revisitation using an Organic Bookmark Management System

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ABSTRACT
With roughly a third of the world’s population now having access to the internet, the area of web efficiency and its optimal use is of growing importance to all online users. We are approaching a tipping point where the majority of people will have spent more time online than offline. With this in mind, the function of revisitation, where a user wants to return to a website that they have visited in the recent past, becomes more important. Current static, textual-list approaches developed within the latest versions of mainstream web browsers such as Internet Explorer, Firefox, and Chrome leave much to be desired. This chapter suggests a new approach via the use of organic, visual, and contextual cues to support users in this vital task area.

INTRODUCTION
Cisco Visual Networking Index (VNI) Forecast has projected that there will be nearly 3 billion internet users by 2015, that is to say that there will be more than 40% of the world’s population who have access to the benefits and drawbacks of the World Wide Web (Cisco, 2011). With so many people online, internet traffic and data flows are becoming as congested and overloaded as our roads. Computer users report that they find it difficult and sometimes impossible to manage their online lives in an efficient manner, and they experience increasing frustration when finding and re-finding important information. The design and utility of web browsers are therefore becoming
more and more important. What will happen when 80% of the world’s population is online?

Current browsers offer standardized functions such as Bookmarks (Favorites) and History to assist people with data retrieval i.e. revisitation. The management of Bookmarks (Favorites) requires a great deal of effort in terms of personal organization if it is to work efficiently. A long list of History records could actually end up preventing the finding of information. Many internet users would rather carry out a new search in revisiting their desired web pages than find them from within their bookmark and history collections, which for an experienced user might amount to several hundred websites per week. A number of recent studies have shown that between 46-81% of users web pages had been revisited (Tauscher, 1997; Cockburn & McKenize, 2001; Weinreich, et al., 2006). Further, Weinreich, Obendorf, Herder, and Meyer (2008) found that the history feature was used in only 0.2% of all revisitation events (Weinreich, et al., 2008), even though its purpose was meant to aid re-finding. Recent ad hoc modifications to the popular IE browser, i.e. the right-clickable back button that shows a list of recently visited websites and the larger sized back button in IE 9 all help with revisitation; however, they do not tackle the main cognitive issue of information presentational overload.

RELATED WORK

Generally speaking, web browsers provide short term revisitation with the functions of Back and Forward, and long term revisitation with the functions of Bookmarks (Favorites) and History. Several research studies have indicated that the Back button is more often used, compared to the Forward button. The Back button made up of 35.7% of actions by Catledge and Pitkow (1995), 31.7% of actions by Tauscher and Greenberg (1997), and 14.3% of actions by Weinreich et al. (2006). The Forward button only made up 1.5% of actions from the research by Catledge and Pitkow (1995), 0.8% of actions by Tauscher and Greenberg (1997), and 0.6% of actions by Weinreich et al. (2006). Latest research has shown that the use of the Back and Forward buttons has been in decline over the last decade. The reason for this is that they have their natural limitations to support revisitation, because of their temporal mechanism, which only allows a certain amount of the recent visited pages.

For long-term revisitation, the function of Bookmarks offers the management system for the users to store their desired links. It heavily relies on personal efforts to categorize and organize. It is a common experience that users have to spend a lot of time on retrieval, and might not be able to succeed in finding the webpage from their big collection of Bookmarks. When getting frustrated, most users would rather launch a search engine in order to re-find the lost information. Current bookmark management systems depend on either directory or keyword mechanisms for labeling bookmarks. The retrieval of information could become very difficult, if they have not been well organized.

The History function is supposed to allow users to easily track their previously visited web pages. For example, Internet Explorer 9 has combined Bookmarks with RSS feed, whereby the user could sort history lists up to 999 days by site name, most visited sites, order visited today, date and search. However, the textual list of history has its drawbacks; it is often the case that users face the same experience as Bookmarks in that the required websites could not be recovered within the history list. Several recent studies conducted by the authors have concluded that a high proportion of users do not know how to use these features, or even that they exist.

There have been many suggestions in reinforcing the above-mentioned features. Milic-Frayling, Jones, Rodden, Smyth, Blackwell, and Sommerer (2004) proposed SmartBack that allows the user to jump directly to key pages based on their
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