

Indexed Web Navigation

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Abstract

The user of the Web browsing application is subject to the limited navigational functionality of the browsing application itself, such as the back button, the forward button and the home button. Besides these three navigation buttons and the bookmark function in the Web browsing application, there are no other navigational aids provided to the user. Because of this limited functionality, users are subject to visiting irrelevant pages while searching for information. This creates unnecessary traffic on the Internet and wastes time. Additional navigation functionality in the Web browser is needed to provide users a more efficient means to navigate the Internet for information. In this paper we proposed the integration of an index button to a Web browser. A custom Web browser with site indexing capabilities through an index button was developed. A group of 30 users were asked to search for information using this browser. Another group of 30 users were asked to look for the same information using a similar browser without the index button. The results of this experiment showed that users of the browser with the index button were able to find information faster, made fewer errors and viewed fewer pages while performing the test. This study showed that users could find information faster by using a browser with site indexing capabilities. The study also demonstrated that the Internet traffic could also be reduced by using this type of browser.

1. Introduction

The usefulness of the World Wide Web (WWW) or “Web” as a tool for finding information is evident since its creation on the Internet. The navigational functionality

that is provided by the Web browser is limited. The browser provides three navigational buttons: *Back*, *Forward* and *Home*. From these three buttons the *Back* button is by far the most used. The other two are rarely used.

A Web site may add navigation functionality by providing buttons in its pages that enable the user to access pages within the same site or other sites. There is no standard for the representation of these navigational tools. A label, button or picture may represent a link. The person searching the Web for information will come across many different ways to represent and organize the links and content of different Web sites. These variations of Web sites may confuse and mislead the user, thus resulting in wasted time and unnecessary Internet traffic [Borges 96].

A study has shown that using alphabetical indexes as links can help users to find information faster while at the same time reducing the number of visits to non-related pages [Ponce, 97]. This study implemented links indexes as popup menus within pages. By clicking a button on the page the users could accessed an alphabetical list of links of the page pointed by the button. Another study demonstrated that providing an index page on a site, that could be accessed from

any page of the site, users could find information faster [Borges97].

Based on the effectiveness of using indexes demonstrated by other studies we propose that the site indexing functionality be moved to the Web browser. In the following section we describe how to provide site indexing capability to a browser.

2. A Browser with Site Indexing Capability

A Web browser application was designed to simulate the appearance of the Netscape Navigator browser so that it would be familiar to potential users. An INDEX button was added to the browser interface next to

the BACK and FORWARD navigation buttons of one of the custom browsers (see figure 1). The INDEX button displays an alphabetical index menu when pressed. This menu contains submenus for each letter. Each entry of the submenu is a link to a page on the site. Selecting a topic of the submenu will get the user to a page in the current Web site. The page is displayed in the browser window.

The index menu is generated from a index file. This file is located in the directory of the homepage of the site. The browser searches the directory structure starting at the directory of the current page until it finds the index file.

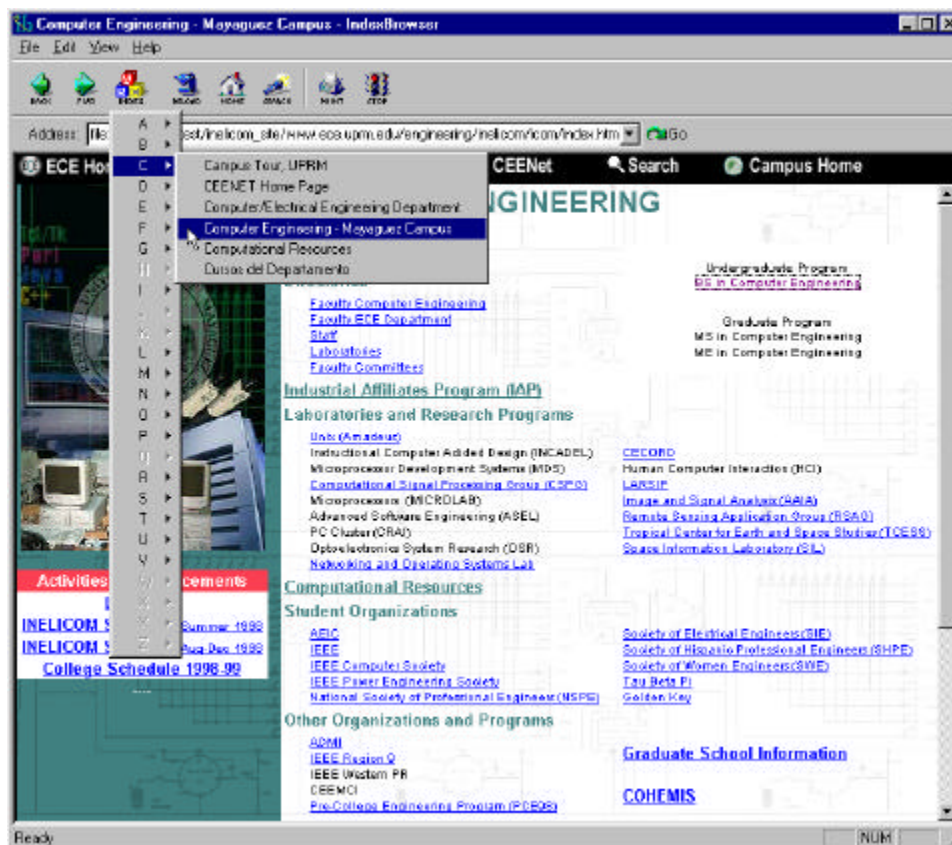


Figure 1.

3. Methodology

Two versions of a custom browser were created. One version had the site indexing capability. The other version was the same browser without site indexing capability.

Sixty users participated in the study. Thirty participants used the browser with site indexing capabilities and the other thirty used the browser without the index. The users were given 18 tasks, which required them to navigate three different Web sites for information. The tasks were increasing in difficulty, so users would gain confidence and not be easily frustrated while performing the test.

The test Web sites were a computer game utility site, a computer manufacturer site and a computer storage device site. The Web sites were unknown to users so that there was no bias of knowing where information could be found in any of the sites. The Web sites were stored locally on the test computer so that connection latency would not affect the timing of loading Web pages. An index file was placed in the home directory of each Web site to provide the topics of the INDEX button sub-menus of the browser with site indexing capabilities.

4. Results

Measurements were taken on several criteria that reflect the use of the Web browser while searching for information on different Web sites. The most significant criteria measured are the time to complete tasks, the use of the browser buttons, the number of page misses (unnecessary pages visited) , and the amount of pages visited.

The amount of time used to complete tasks

was one of the most significant in the tests. Index users generally saved time in all of the tasks in the tests. The time was measured from when the user started to look for information until it was found. Index users were 40.4% faster than non-index users (see figure 2).

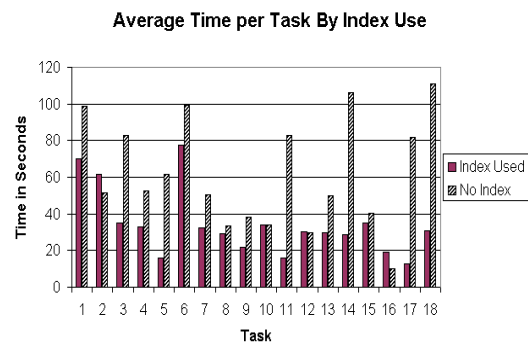


Figure 2.

The use of the interface navigation buttons was measured as users navigated the test Web sites for information. The BACK button was the most used button among the participants that did not used site indexing (see figure 3). However the used of the BACK button was significantly reduced among the participants that used site indexing. The INDEX button was the most used among this group. The FORWARD and HOME buttons were rarely used by both groups of participants.

The number of page misses was significantly reduce among the participants that used site indexing in comparison with the group that did not used site indexing. Index users performed 66.0% fewer page misses than non-index users (see figure 4). This reduction in the number of page misses can be attributed to the fact that index users were able to go directly to the page they needed through the index menu instead of searching the site hierarchy.

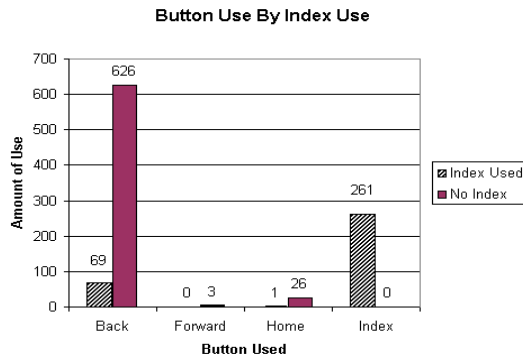


Figure 3.

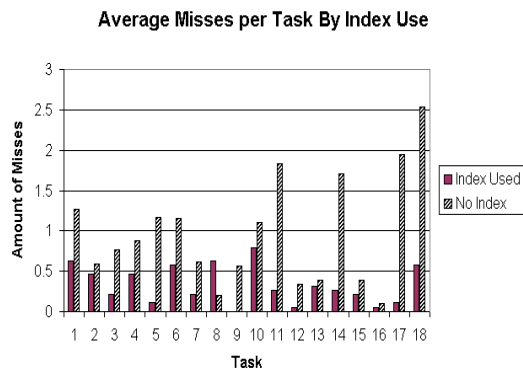


Figure 4.

Index users visited 20.8% fewer pages than non-index users (see figure 5). This result is very significant because this reduction in the number of pages visited traduces to a reduction in Web traffic.

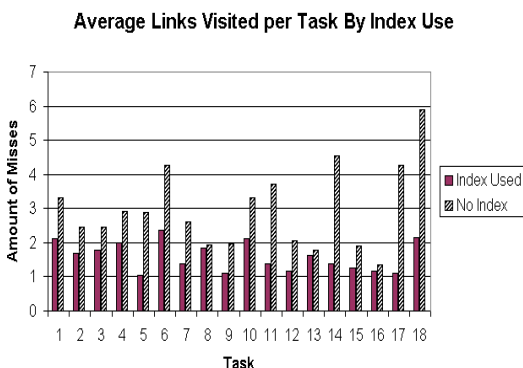


Figure 5.

5. Conclusions

This study concludes that site indexing improves user navigation. Participants were observed to complete tasks in less time, access fewer pages and commit fewer errors. Users were able to find information directly by using the INDEX button. This resulted in fewer errors and fewer page misses, thus reducing the amount of traffic. Users were satisfied with using the browser with site indexing capabilities because it allowed them to quickly accessed pages of the site through an alphabetical list of topics related to the site.

The improvement in Web navigation through site indexing shows that there is a good reason to support this feature in Web browsers. Adding site indexing capabilities to Web browsers will improve Web navigation worldwide.

References

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