

# Improving the Accessibility of Dynamic Web Content for Older Users

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## ABSTRACT

The Web is changing. The much vaunted Web 2.0 sees once static pages evolving into hybrid applications. Content that was once simple to surf is now becoming increasingly complicated due to the many areas of dynamic content “dotted” throughout the page. In previous studies, we have shown that unlike younger users, older users have more varied interaction patterns when using dynamic content. In addition, some older users are not aware of what to expect when interacting with dynamic content and show signs of hesitancy and uncertainty when completing tasks. In this paper, we present a tool designed to assist older users as they use Web 2.0 content and reduce the hesitancy and frustration that was previously identified.

## Categories and Subject Descriptors

H.5.4 [Information Interfaces and Presentation (e.g., HCI)]: Hypertext/Hypermedia – User Issues

## General Terms

Human Factors

## Keywords

World Wide Web, Web 2.0, Accessibility, Older Users

## 1. INTRODUCTION

The Web is undergoing a profound change. Once static documents have evolved into composite applications created from multiple third party sources delivering dynamically changing information streams. Websites such as Flickr<sup>1</sup> and Facebook<sup>2</sup> all rely on these new components and are all popular with users. While this can provide a richer Web experience for a majority of its users, for some users the addition of dynamic content can be problematic [1]. This is due to

<sup>1</sup><http://www.flickr.com/>. Accessed: 7<sup>th</sup> January 2011

<sup>2</sup><http://www.facebook.com/>. Accessed: 7<sup>th</sup> January 2011

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content that was once simple to browse becoming increasingly complicated due to the many updating components located throughout the page [2].

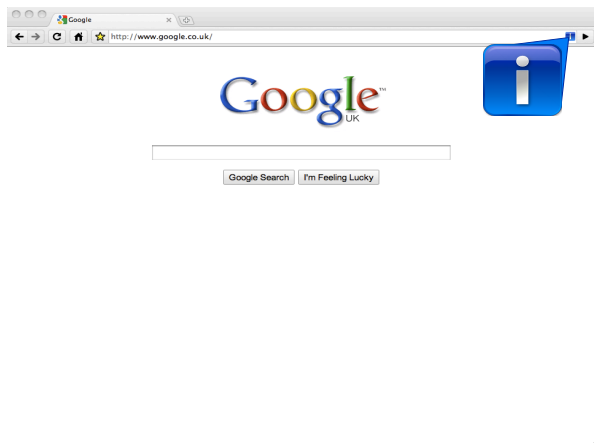
For users who are not familiar with Web 2.0 concepts the increased complexity can prove to be a hindrance that detracts from the benefits that the Web can provide. Studies have shown that elderly Web users experience a heightened cautiousness and a hesitancy about making responses that may be incorrect [3, 4]. In addition, elderly users show difficulty in maintaining attention, focus, and concentration on tasks where there is a lot of distracting information [5]. In noisy information environments this hesitancy produces lower performance and higher levels of stress and frustration that negatively effects both work and social activity.

## 2. SCWEB2 ASSISTANT TOOL

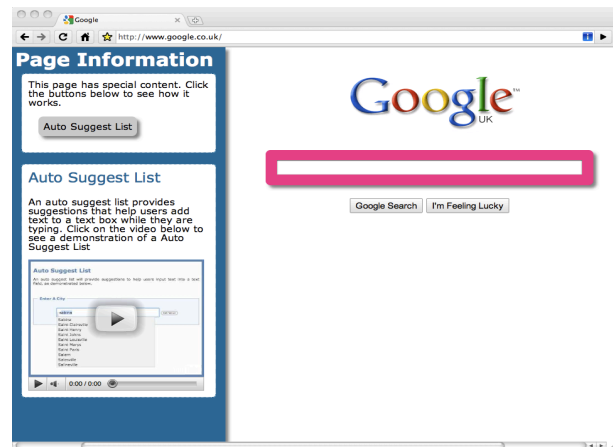
In previous studies [6], we have demonstrated that some older users show signs of hesitancy and uncertainty when completing Web 2.0 based tasks. While some of the users in the study were comfortable when interacting with Web 2.0 content, there were others who were not aware of what to expect. The Senior Citizen on the Web 2.0 (SCWeb2) Assistant Tool is therefore designed to assist and train older users so that they are aware of what type of content is on the page and how that content operates.

The SCWeb2 Assistant Tool was implemented as a browser extension that made use of a number of Web services to analyse the page and provide assistance to the users. A browser extension was used because, as Hanson and Richards note, “users tend to prefer a standard browser with the accessibility transformations added rather than a specialized browser offering only a limited set of features (which would also tend to mark them as being disabled)” [7]. Creating an extension that users were in control of allowed them to feel as though they were not disabled or needed special technologies that were different from other people.

Being integrated into the browser, the SCWeb2 Assistant Tool operated as a background process as soon as the user loaded a Web page. As the browser was rendering the page, the SCWeb2 Assistant called the Widget Detection Service with the page URL to establish if any dynamic content could be identified. After analysing the page, the Widget Detection Service returned to the SCWeb2 Assistant Tool a list of widgets that had been detected on the page. At this point, the SCWeb2 Assistant Tool called the Widget Catalogue Service to check that the widgets found existed within the catalogue. The Widget Catalogue Service contained all



(a) The Google Home Page. The SCWeb2 Assistant icon has appeared as this page contains dynamic content.



(b) Clicking the SCWeb2 Assistant icon help for the dynamic content used on the Google Home Page.

**Figure 1: Example of how users can receive assistance for dynamic content contained on the Google Page.**

the training materials associated with a given widget and so calling this service ensured that when users were presented with a list of dynamic content that was present on the page, help was available. We assert that users of the SCWeb2 Assistant Tool will be hesitant about using the Web, hence the need for the tool. To offer assistance and then provide a message saying “assistance for the given content is not available” would further undermine their confidence. While the extra service call degraded performance slightly, the benefits to the user offset the small loss of performance. Furthermore, the use of Web Services allowed the tool to provide assistance that was up-to-date and timely. The Widget Detection and Widget Catalogue services could be extended and refined, and those modifications would be immediately available to all users without the necessity of complex and confusing software upgrades.

Upon detecting widgets, an icon was presented to the user to indicate that widgets had been found and assistance could be provided. This can be seen in Figure 1(a). As we observed in [6], older age groups, unlike younger groups, have more varied interaction patterns. By using an icon in this manner, users can request assistance if they require it by pressing the button. As our previous studies noted, some participants were comfortable using Web 2.0 content where as other users were not. Providing assistance when users did not require it would be frustrating and negate any benefits that the tool brought. Therefore if users did not require assistance, they could ignore the button and browse the page in their usual manner.

Figure 1(b) shows the result of a user clicking the assistance button. This resulted in a side-panel appearing with the list of dynamic content that was present on the page. In this example, there was only one widget identified which was an auto suggest list. Users could select the widget that they required assistance for, which resulted in a short explanation and demonstration video being displayed that was provided by calling the Widget Catalogue Service. As the user was being shown the demonstration, a highlight appeared on the page so users could relate the demonstration to the actual page. This allowed users to practice what they were learning as they watched the demonstration.

### 3. CONCLUSION AND FUTURE WORK

The SCWeb2 Assistance tool is an experimental prototype that acts as a training aid as older users interact with the Web. The tool is designed to be extensible and provide assistance only when users require it. Our next goal is to ensure that the assistance provides benefit to older users accessing Web 2.0 content. To do this, we are embarking upon a series of user studies to confirm the usefulness of the current assistance and to establish extensions to the functionality provided.

### 4. ACKNOWLEDGEMENT

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