

Designing Beneath the Surface of the Web

Sarah Horton
Dartmouth College
6224 Baker/Berry
Hanover, NH 03755 USA
603 646-1087

sarah.horton@dartmouth.edu

ABSTRACT

At its most basic, the web allows for two modes of access: visual and non-visual. For the most part, our design attention is focused on making decisions that affect the visual, or surface, layer — colors and type, screen dimensions, fixed or flexible layouts. However, much of the power of the technology lies beneath the surface, in the underlying code of the page. There, in the unseen depths of the page code, we make decisions that influence how well, or poorly, our pages are read and interpreted by software. In this paper, we shift our attention beneath the surface of the web and focus on design decisions that affect nonvisual access to web pages.

Categories and Subject Descriptors

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

General Terms

Design, Human Factors, Standardization

Keywords

Accessibility, Usability, Universal Usability, Universal Access

1. INTRODUCTION

In a web transaction, the first read of a page is by software that parses and acts upon the source code: for example, by rendering the page visually, reading the page aloud, or extracting and storing information about the page. The accuracy and effectiveness of software's rendering and actions is affected by the quality and design of the source code.

In striving to achieve good design, we generally focus on visual presentation. Our efforts are aimed at designing a visual display that is usable and appealing, with little attention given to the source code since visual users are only indirectly affected by its design. However, nonvisual users, such as vision impaired users and search engine software, do not work with the visual display. Unlike visual users, their experience is directly affected by the design of the underlying source code. Organization, quality, and

clarity influence how well software can read and interpret the source code. Nonvisual web access can be improved by applying the following guidelines for source code design.

Shneiderman defines universal usability as an approach to design that is focused on “enabling all citizens to succeed in using information and communication technologies to support their tasks” [18]. A focus on page code design improves the universal usability of web pages by addressing access challenges in a variety of contexts. For instance, the small viewport on mobile devices presents many of the same challenges as nonvisual access. This paper concludes with a discussion of how these guidelines can be applied to improve web access for mobile users.

2. GUIDELINES

Several factors influence the effectiveness of nonvisual web access. As with most applications of universal design [5], these factors improve access for all users, including visual users and users of mobile devices.

2.1 Integrity

The soundness and stability of document structure.

2.1.1 Use markup to describe document structure

Designers have a toolset of time-honored principles to communicate the structure of a document. Alignment and proximity convey information about the relatedness of elements. Typographic emphasis draws attention to important elements [10]. While effective, visual design is not a science. Structure is only implicit in the application of these principles. Additionally, principles are often misused, or abandoned in favor of more avant-garde approaches. At the end of the day, visual design conventions are meaningful to people who can see them, and even among those who can see them, are open to interpretation.

On the other hand, markup provides a means to explicitly define document structure. With markup, designers can embed information structure and relationships among page elements into content of a document. Encoded structure can be read by software, making possible “a web of data that can be processed directly or indirectly by machines,” envisioned by Berners-Lee [1].

HTML offers designers a set of tags for use in describing information structure of web documents. While limited, these tags add a layer of meaning, thereby enhancing software's capacity to read and interpret of web documents. In addition, software can use structural markup to provide additional functionality to the user, such as providing a document overview using heading tags, or announcing the number of items in a list.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

W4A at WWW2006, 23rd-26th May 2006, Edinburgh, UK
Copyright 2006 ACM 1-59593-281-x/06/05...\$5.00.