AJAX¹ Design and Usability

William Hudson
Syntagm Ltd
10 Oxford Road
Abingdon, UK OX14 2DS
+44 1235 522859
whudson@acm.org

ABSTRACT

AJAX, and related approaches that enable greater levels of interaction within web pages, have the potential to both help and hinder usability. This half-day interactive tutorial examines the issues, providing examples and guidance on appropriate application of these technologies.

Categories and Subject Descriptors

H.5.2 [User Interfaces]: Graphical User Interfaces; User-centred design.

General Terms

Design, Human Factors.

Keywords

AJAX, Change Blindness, Attentional Gambling, Flow.

1. INTRODUCTION

At its inception, the World Wide Web used a page-based model with most changes of content requiring that a new page be loaded from the host site. This approach introduced a number of usability problems relating to users' inability to notice changes to content (change blindness) or, in the case of completely new pages, uncertainty over where their attention should be focused (attentional gambling). The move away from the page-at-a-time model afforded by client-side scripting, the Document Object Model and AJAX¹ can help to address these issues when used appropriately. However, they can easily introduce a large variety of usability problems instead of or in addition to those just described. The purpose of this tutorial is to introduce attendees to the issues, provide guidelines on the appropriate use of AJAX from a usability perspective and to review a case study of a sample AJAX implementation.

2. ATTENTIONAL ISSUES

2.1 Change Blindness

Change blindness occurs when the movement normally associated with change is temporarily masked. With the traditional page-at-a-time model, this masking occurs every time a new page is loaded[1]. For example, in the tutorial, the image shown in figure 1 is alternated with one that includes a

non-trivial difference. Because of a 250 ms grey field that separates the two images in time, many participants often do not find the change at all.

Figure 1: Change Blindness Example

A related issue, inattention blindness, where users do not see even very large changes because their attention is elsewhere on page, can be addressed. The more dynamic nature of AJAX can help to avoid these issues when used appropriately, but designers must be careful to address 'mud splash blindness' (where a visual distraction can mask change) and attentional gambling, where users simply guess incorrectly where they should be looking on the page.

2.2 Attentional Gambling

Attentional gambling[2] refers to the choices that users must make when viewing a page. For example, in completing a single column form, users will tend to work in left-to-right, top-to-bottom order. Messages or controls that appear in the periphery of the screen will tend to be ignored unless special steps are taken – such as animation – to make them more apparent. The more dynamic approach to page updates allowed by AJAX can improve the success with which users will see intended feedback but only when account is taken of where attention is likely to be focussed.

A general example is shown in figure 1. After adding an item to their shopping basket, users will focus their attention on A (at the Add button) but the site in question updates the basket details at B (in the top right corner). Consequently, users tend not to notice that information.

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Published by the British Computer Society

Volume 2 Proceedings of the 21st BCS HCI Group Conference

HCI 2007, Lancaster University, 3-7 September 2007

Devina Ramduny-Ellis & Dorothy Rachovides (Editors)

¹ Asynchronous JavaScript And XML.

Figure 2: Attentional Gambling Example

3. FLOW

AJAX technologies can also be used to improve flow – a user's engagement and sense of immersion in an interaction. Again, as with attentional issues, designers must optimise feedback so

that users feel in control without the frustration of excessive interruptions.

4. CASE STUDY

The tutorial concludes with a case study of a simple AJAX application that follows web design standards:

- Separation of content (HTML), presentation (CSS) and behaviour (scripting)
- Graceful degradation / progressive enhancement

The application demonstrates these basic principles and allows participants to understand the basic issues of the technology itself; the simple HTML and JavaScript used are fully explained.

5. REFERENCES

- [1] Hudson, W. Designing for the Grand Illusion. *SIGCHI Bulletin*, 33, 2001, 8.
- [2] Hudson, W. Attentional gambling: getting better odds from your web pages. *interactions*, 11(6), 2004, 55-56.