

An Evaluation of WebTwig – a Site Outliner for Handheld Web Access

Matt Jones¹, Geroge Buchanan¹ & Norliza Mohd-Nasir¹

¹ Interaction Design Centre, School of Computing Science, Middlesex University, London
UK N11 2NQ
{m.jones, k.boone, george10, n.mohd-nasir }@mdx.ac.uk

Abstract. Interaction problems occur when small-screen devices (PDAs, Palmtops etc) are used to access Web pages designed for conventional, large-screen displays. To overcome some of these problems, we have developed a tool, WebTwig, which is designed to improve Web access on small-screen devices. We have carried out an experiment to assess the usefulness of WebTwig. Our results indicate that the tool can improve a user's performance and satisfaction.

1. Introduction

Users are beginning to use handheld computers to access Web pages. The display –area of these devices is much smaller than that found on desktop machines. Most Web pages are produced for conventional desktop viewing. In an earlier study [1], we proposed there would be serious interaction problems if handheld computers were used to access such conventional pages.

The results of our study, along with review of literature concerning information visualisation, led us to develop a new tool, WebTwig [2] that can automatically adapt conventional web sites to be more effective for handheld computers. This poster reports on an evaluation of the use of WebTwig for the task completion.

2. WebTwig

WebTwig [2] provides a tree-based outline view of an entire site. Outline views present users with a high level view of the information content which can be manipulated until the required detail is achieved. Outliners have been used in many applications from word-processing to mapping applications.

3. The study

For the study we created two handheld simulations, both simulations were able to display the same number of lines (approximately, the size found on typical Windows CE machines).

One simulation displayed the original desktop-optimised site without any adaptation for handheld displays. The other presented the WebTwig view of a site. Example screenshots of the two simulations are shown below in Figure 1, below.

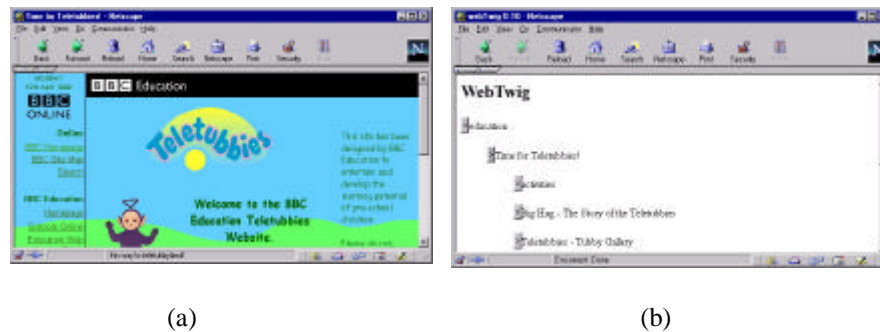


Figure 1 – example displays used in the study. (a) is the view on a small screen without any site adaptation; (b) shows an example of the site view via WebTwig – note the structured display of topics and the arrow icons which allow users to expand/ collapse topics.

Twenty-six volunteers, all with similar profiles (e.g., in terms of web literacy, experience of handheld display and so on), were used in the study. These volunteers were divided randomly into 2 groups of 13. We asked each group of user to complete 4 tasks using 4 sites (1 task per site). One group used the unadapted site view (e.g., see Figure 1(a)); the other group used the WebTwig view (e.g., Figure 1(b)).

Two of the tasks required a specific correct answer – we called these the ‘direct’ tasks. The other two allowed users more flexibility and choice in terms of answer – these were the ‘indirect’ tasks.

WebTwig builds outline views from the physical directory structuring used to organise the Web site. Two of the sites in the trial were organised with a good hierarchical structuring of Web pages (the ‘structured’ sites) while the other 2 had no structure (‘flat’ sites).

Each of the four tasks, then, involved a different combination of task type and site characteristic: direct/structured, direct/flat, indirect/structured and indirect/flat. The aim of these combinations was to ensure a fair assessment of WebTwig without bi-

asing the results by using tasks/ sites that were could be thought of being particularly suited to the approach.

We recorded the time that each user took to complete each of the four tasks. As they completed each task, we asked them to rate the effectiveness of the simulation in helping them to reach their goals. A scale of 1 to 9 (with 1 representing very poor and 9 excellent) was used in this part of the evaluation.

4. Results

Table 2 presents an overview of the results of the study. As can be seen, overall, WebTwig users were able to complete tasks 35% quicker than the group that had to use the unadapted sites. Similarly, WebTwig was rated more highly than the unadapted sites – WebTwig users found the WebTwig view more effective in completing tasks than did the users of the unadapted sites. The better performance of WebTwig was seen in all four tasks; however, the differences in performance were less marked for the task where the task type was indirect and the site type flat.

	Average time (secs) to complete a task	Average effectiveness ranking in completing a task (1-9, poor to excellent)
Group 1: Using unadapted site view	155	4
Group 2: Using WebTwig view	102	7

Table 2: Overview of study results

5. Conclusions

Our study has shown that outline views for handheld web-site use has good potential. WebTwig automatically produces such views from any site, improving accessibility for handheld users. We are currently improving WebTwig to provide a search mechanism so that views can be pruned and so that more than one form of outline view can be generated.

References

1. Jones, M., Marsden, G., Mohd-Nasir, N., Boone K. & Buchanan, G. (1999). Improving Web interaction on small displays. Proceedings of W8 conference, Toronto, May 1999 (Also reprinted in International Journal of Computer and Telecommunications Networking, 31 (1999), 1129-1137).
2. Jones, M., Marsden, G, Mohd-Nasir, N. & Buchanan, G. (1999), A site-based outliner for small screen web access. Proceedings of W8 conference, Toronto, May 1999.