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## **Between-Page Banner Advertising (BePBA) on the Web: A Solution Where Usability and Advertising Meet**

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**Abstract:** Animated online advertisements on Web pages cause difficulty for users to acquire information on such Web pages. As a result, users learn to ignore banner advertisements. It consequently causes ineffectiveness of online advertising. This paper proposed the new technique for banner advertising placement, called Between-Page Banner Advertising (BePBA) in which it places a banner during the transition from one Web page to another. This technique promises to increase effectiveness of advertising while minimizing the usability defection of online banners.

### **Introduction**

Unlike printed publications and broadcastings, World Wide Web (WWW) is a relatively new medium that has been invented only less than a decade ago. As a result, it still has a large number of issues open for studies in order to improve the use of this upstart media effectively. During the emerging period of the Web, it is generally considered as an alternative of printed publications in which it contains richer interaction capabilities and wider accesses. For that reason, techniques studied for printed publications are usually extended to the Web. However, because the Web holds a number of its unique characteristics that noticeably differs from printed publications, several techniques fail its purposes and raise usability problems. Among them, techniques for placing banner advertisings on Web pages face serious failure and causes severe usability issues. Nevertheless, advertising is currently the primary source of revenue for most Web sites. Therefore, the issue on effectively delivering banner messages to Web users becomes vitally important. In this paper, a technique to place banner advertisings on Web sites called Between-Page Banner Advertising (BePBA) is presented as a solution for Web advertisings. BePBA is expected to deliver banner messages effectively at minimum usability interferences. An experimental study on the effectiveness of BePBA is also proposed in this paper.

## **Trend in Banner Advertising**

On-line advertising has increased its significance to businesses around the world. Since then, among various types of on-line advertising media (e.g., banners, buttons, and text links), Web banners have become the most widely used on-line advertising media (Meland, 2000). High expenses on Web advertising spent by Web advertisers over the years have created high revenues to Web publishers. A very recent report shows that Merrill Lynch predict no growth in on-line advertising in the year 2001, whereas IDC and Forrester Research predict 12 percent and 36 percent growth, respectively (Lawrence, 2001).

## **Navigation Problems**

Navigation, the most important activity performed on the Internet, refers to the process of moving from one route to another by examining the chosen route from data, knowledge and experience observed from environment and built up in mental model (Borges et al., 1998). World Wide Web (WWW) is always recognized as an alternative of printed publications. Thus, techniques used for printed publications are frequently employed to the Web. Nevertheless, the Web contains several characteristics that noticeably differ from printed publications. The most significant difference is that the Web lacks obvious navigational structure, whereas printed publications, as tangible objects, express their navigational layouts explicitly. As a result, the problem of navigational structure for the Web is largely concerned than do printed publications. Moreover, in contrast to people who read information from traditional media, on-line readers deal with more activities while reading, such as replying to emails, navigating Web sites, and chatting on-line (Lewenstein et al., 2000). As a result, Web users report the "cognitive overload" problem. The problem occurs when a user is overwhelmed with performing several on-line tasks simultaneously (Pilgrim & Leung, 1999). Occasionally, users also experience the "lost in space" problem, i.e., users may not remember which Web pages they visited before reaching the current page (Pilgrim & Leung, 1999). Other than these problems, a Web page itself contains objects that can distract users such as graphics, video clips, images, and banner advertisings. In other words, reading online requires one to deal with more distractions than reading from paper.

## **Usability Problems of Banner Advertisings**

Understanding strategies in acquiring desired information on-line is essential and guides research and practices in Web page design. For instance, a current study in Web reading and eye tracking shows an interesting investigation on human visual attention patterns when seeking information on newspaper Web sites (Lewenstein et al., 2000). The preliminary results show that on-line readers fixate their eyes on abstracts or captions first, and then graphics and images second. More interestingly, this study also shows that subjects look at 45 percent of all banner graphics displayed on the screen, which is considered a significant percentage for on-line advertising. The average time of eye fixation on these banner advertisements is 1 \_ seconds. Moreover, other empirical studies provide evidence that Web users experience reading concentration difficulty on Web pages containing animated graphics (Nielsen, 2000; Spool et al., 1999) Despite the proliferation of animated on-line banner advertising on Web pages, Web users report difficulty in acquiring information on such Web pages. To date, only a few researchers have explored usability perspectives of animated banner-advertising effects in information seeking on Web pages (e.g., Zhang, 1999). In fact, a number of current Web sites are designed to use rapidly animated, highly colorful banner advertisements aiming to gain "click-through". In Web page design, it is recommended to minimize the use of animated graphics and promote using non-animated or static graphics (Nielsen, 2000). Moreover, according to a study of Web usability by the User Interface Engineering Company, even though animated advertising banners are more effective at gaining click-through than static banners, animated advertising banners may not communicate their messages to users (Spool et al., 1999). Rather, animated banners can distract user attention in retrieving desired information on the Web pages (Spool et al., 1999). Thus, the study recommends that Web designers should be concerned about the purposes of Web sites in considering using animated graphics. For instance, using animated graphics on commercial Web sites might be more appropriate than using them on informative Web sites. Yet, with the rapid growth of business competition on the Internet, companies need effective advertising media to attract potential Internet customers. The trend in placing banner advertisings on Web pages might be inevitable, since businesses, particularly "dot-com" companies, can corporately gain revenues and increase brand awareness from

banner advertising. Many Web sites can exist in the Internet because of revenues gained from banner advertisements. For instance, news and media Web sites e.g. Yahoo are able to provide news for free to Web users because the companies gain revenues from banner viewing and clicking. Nevertheless, experienced Web Users might have learned to ignore banner ads. The Internet advertisers attempt to force Web users to look at the banner ads and hope to gain click-through rates. Recently, the Internet Advertising Bureau (IAB) has proposed the new banner ads guidelines by making larger ads, 250-by-250 pixels and 120-by-600 pixels (Kapadia, 2001). Several Internet media companies have already been using these new-sized banner ads such as Yahoo (<http://www.yahoo.com>) and CNET (<http://www.news.com>). However, intuitively, users seek for their desired information and they do not want to see any distracted elements of the Web pages. Therefore, the harder the users try to ignore banner ads, the more they feel annoyed. This recent attempt of using actively animated and relatively large advertisements, as agreed by major Web sites, may be still ineffective and in turn causes larger usability problems. However, if banner revenues are continuously decreasing, such companies might employ subscription technique with Web users in accessing to news from their Web sites.

## **Related Studies in Banner Advertisings**

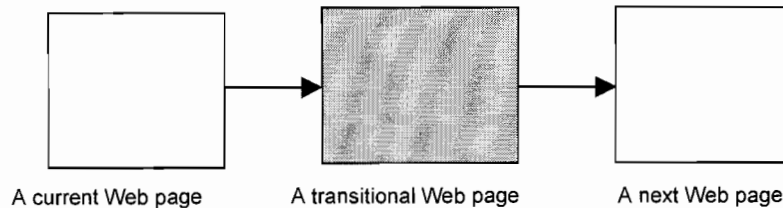
Researchers and practitioners have responded enthusiastically to on-line banner advertising. While advertising researchers might attempt to answer how many times users actually see the banners and how many Internet users visit the advertised Web sites, the HCI people might attempt to explore how Internet users process information while they navigate the Web site containing banner advertisements. Current studies in an advertising arena express concern over understanding banner-clicking processes to increase a click-through rate - a percentage of visitors who click on banner advertising. Cho and Leckenby (1999), for instance, explore a level of user involvement in clicking on Web banners. Another study develops the model of banner clicking by focusing on several variables of banner advertising such as size and animation (Cho and Leckenby, 1999). The studies show that a variety of banner factors such as animation, color, banner message, and location can influence such processes. In cognitive psychology, however, very few studies regarding cognitive processes of human interacting with on-line banner advertisements have been conducted (e.g. Noiwan & Emurian, 2001; Noiwan & Norcio, 2001; Zhang, 1999). Two attributes of objects that can distract visual attention the most are motion and color (Constantine & Lockwood, 1999). Several empirical analyses provide evidence regarding the effects of graphic motion on visual attention. In the periphery, moving targets are detected more easily than static ones (Ware, 2000). Other studies by (Faraday & Sutcliffe, 1997) conclude that motion has strong attentional effects. Another study by Hillstrom and Yantis (1994) conclude that objects presented in a loop of appearance and disappearance can attract attention. Ware et al. (1992) point out that speed of objects also affects attention, for example, a rapidly moving target is harder to ignore than a slowly moving one. A recent study by Zhang (1999) reports significant differences in different conditions of animated graphics in on-line information seeking. The results show that the animated graphics worsen user performance in searching for the target words. For example, an animated graphic that is similar but irrelevant to a task distracts a user's attention more than an animated graphic that is dissimilar to a task does. Such results become more negative when users are instructed not to ignore the animated graphics. Nevertheless, in terms of advertising banners, animated ones tend to be more effective in increasing a click-through rate than static ones. Noiwan and Emurian (2001) investigate the effects of target word density (i.e., high, medium, and low) and Web page presentation styles (i.e., no graphics, static graphics, and animated graphics) on search time and user preferences. The results show a significant effect of target density on search time. Search time on low-density pages is significantly briefer than on high-density pages, an outcome that validated the experimental protocol. No significant effect is found for page presentation style, and the interaction between target density and presentation style is not significant. Self-report data shows that static graphics pages and animated graphics pages are sometimes perceived differently in terms of usability and aesthetics, and both styles are perceived as visually appealing to users.

## **Between-Page Banner Advertisement (BePBA)**

### **Technique**

As its name implied, BePBA refers to the technique of displaying banner advertising between two Web pages during the transition of one Web page to another, as shown in the figure 1. Generally, the Web page transition

period is the moment when users wait for a next Web page to display. However, not every single Web page that the user visited will follow by a transitional page for banner ads. Rather, the transitional page will be displayed only when reaching some possible criteria (e.g., numbers of the clicked pages or time of navigating through the Web site). Only one banner advertising with 480 x 360 pixel size is limited to one transitional page, as shown in the figure 2. Before a user reaching a transitional page, the informing message about the upcoming transitional page will be displayed in the current Web page. The message aims to inform the user that the transitional page will be shown before the Web automatically taking the user to the page that the user is about to click.



**Figure 1.** The concept of Between-Page Banner Advertising (BePBA) technique.



**Figure 2.** An example of Between-Page Banner Advertising (BePBA).

### Usability Effectiveness of BePBA

An interface plays a role as a mediator between a user and a computer system; and therefore, it should effectively support human information processing by facilitating performance (e.g., speed and accuracy) and satisfaction. Usability, a core concept of HCI, refers to the characteristics of user interface that is easy to use, learn, and remember, pleasant to use and has least errors (Nielsen, 1993). Nielsen develops the comprehensive guidelines to encounter with usability issues, namely, (1) visibility of system status, (2) match between system and the real world, (3) user control and freedom, (4) consistency and standards, (5) error prevention, (6) flexibility and efficiency of use, (7) aesthetic and minimalist design, (8) help users recognize, diagnose, and recover from errors and (9) help and documentation (Nielsen, 1993). Current evidence supports the facts that the current banner placement technique, or within-page technique, as opposed to between-page banner advertising technique (BePBA), annoys users while they seek for information on Web pages (e.g. Nielsen, 2000; Spool et al., 1999; Zhang, 1999). From a theoretical point of view, these users experience the difficulties because they automatically divide their attention to both stimuli: textual information and banner advertising. Attention resource of human is limited in nature, and therefore, attention is a human capacity that can control human response (Wickens & Hollands, 2000). When attention is divided, performance on each task could be lessened. In other words, when more than one task is performed simultaneously, they compete with one another for available limited mental resources, which may finally decrease task performance. Wickens and Hollands (2000) emphasize that two tasks can interfere with each other when they have the same stimulus modality either visual or auditory. In other words, tasks can be performed more easily when each of them is using a different modality. Rather than imitating printed publication concepts, BePBA employs broadcasting media concepts and promises better usability aspects comparing with the within-page banner advertising placement technique. First, by using BePBA in which banner advertising is located in a transitional page between two Web pages, Web users are allowed to use their full attention span to only the context of the Web pages,

and therefore, prevent errors and dissatisfaction in navigating through the Web site. Second, BePBA technique promotes the concept of aesthetic and minimalist design. By separating banner ads from textual Web pages, Web pages containing textual information have more space for Web designers to design visually appealing Web pages. Likewise, banner ads in the transitional page, with the size of 480 x 360 pixels, provide enough room for graphic designers to design more creative and visually appealing banner ads as well. Third, to eliminate the lost in the space problem, BePBA provides users with only necessary information along with displaying advertisement during the transition of a Web page to another. Such information includes time to display the ads, the current location of user navigation, and the link that can automatically take the user to the next page. Forth, another proposed idea that comes with BePBA is the idea of embedding a new HTML element into the HTML tag. This new tag will facilitate all Web designers to use the same standard in integrating banner ads into Web pages. The new tag that may locate in the header section of HTML may be written as `<AD src="/ad/ad1.gif" delay="5">`. This tag instructs Web browser to display the graphic file located at /ad/ad1.gif for 5 seconds before loading a new Web page. Fifth, another idea that comes with BePBA is the proposed ability of Web browser in which the Web browser should be able to save the banner advertising links that users are interested for later visits. Unique numbers of Web sites that placed these banner ads might be kept together with the ads, and therefore, click-through rates could be gained when the users click such banner ads. Sixth, BePBA emphasizes the importance of predictability in displaying the transitional Web pages for banner display by using some possible criteria such as numbers of the clicked pages and time of navigating through the Web site. This technique could reduce annoyance while users navigate through the Web. Lastly, BePBA promotes error prevention by informing a user before reaching the transitional page.

### **Advertising Effectiveness of BePBA**

By implementing the concept of broadcasting media such as television, BePBA aims to increase brand awareness rather than click-through rates (CTRs). Time to display banner ads in the transitional page is the key factor of revenue gaining for Web publishers. Four to six seconds for banner display are presumed to be the promising time that may increase brand awareness and retain user memory from the last visited page. Theoretically, Wickens and Hollands (2000) explains that human's sensory system has an associated Short-Term Sensory Store (STSS) that places within a brain for extending the representation of the raw stimulus. Thus, if a user is distracted while the information is being processed, the user can recover its contents for a few seconds. Accordingly, BePBA is expected to deliver advertising effectiveness with small interferences to the current tasks of users.

### **Future Works: The Experimental Study**

To satisfy Web advertisers, Web publishers, and consumers in on-line businesses, effective banner advertising must be designed and banner techniques must be continuously invented, so that users click on the banners with enthusiasm and use minimal cognitive processes to react to stimuli on the Web pages with pleasure. More importantly, a banner should not decrease visual appeal and usability of a Web page. However, empirical evidence, in terms of cognitive perspectives in human information processing on Web sites containing animated banner advertisings, are remarkably scarce. Still, on-line information seeking has quickly become a daily activity for humans and a number of Web publishers have quickly increased to provide current on-line information and archives for their customers through the Internet. The study will evaluate the concept of BePBA by utilizing a target-word searching task to compare the usability effects between the newly proposed BePBA technique and the current within-page technique of banner advertising. Within-subjects, full-factorial design will be employed. Within-subjects factors include banner placement technique (between-page banner advertising and within-page banner advertising) and banner types (static banner and animated banner). The dependent variables include total search time for the target words, target-word search accuracy, banner-word selection accuracy, and self-reports of usability. MANOVA approach will be used to examine the effects. Spearman rank correlation coefficients will be computed to show the strengths of relationships among dependent variables.

### **Conclusion**

The paper proposes the new banner advertising placing technique, called Between-Page Banner Advertising or BePBA. The paper points out shortcomings of the current banner advertising techniques and presents the strengths of BePBA. Theoretical points of view with regards to usability and visual attention are mainly

discussed. The proposed technique will be experimentally evaluated in comparison with the current technique. The proposed within-subject experiment is discussed briefly.

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