The Impact of Web Animation on Users: Getting the Message across Literature

Authors:
1. Golnessa Galyani Moghaddam, M.L.I.Sc, PhD
Faculty of Dept. of Studies in Library & Information Science,
Shahed University, Tehran, IRAN
Email: g_galyani@yahoo.com

2. Mostafa Moballeghi, B.E., M.Tech.,
Ph.D Student, B.N.Bahadur Institute of Management Sciences,
University of Mysore, Mysore-570 006, INDIA
Email: m_moballeghi@yahoo.com

Abstract:

Animations are seen in many web sites throughout the Internet. Ease of use is considered as a possible reason for the growing use such multimedia feature in designing of web sites. While animations are ubiquitous in the Web environment, there is an inadequate understanding of its effect on user's attention. Animations are advantages of information technology for web designers, but important questions remain about whether animations work in all situations and for all users. Focusing on web animation, this paper reviews literature and at the end it extracts guide lines for better designing of websites.

1. Introduction

The proliferation of websites on the Internet poses a significant challenge on users' limited attentional resources. Now a days, various kinds of animation are widely used on websites in order to attract online users' attention. The growing use of animation in Web pages testifies to the increasing ease with which such multimedia features can be created. The increased use of multimedia technology is changing the face of the Internet and Web-based media, but its impact on users has not been thoroughly studied and despite the vast use of animation, little is written about its effect on attention. The purpose of this paper is to prepare a literature review on animation studies and find some guide lines to prepare more effective animations.

2. Animation in the World Wide Web

Animation is a dynamic visual statement, form, and structure evolving through movement over time (Beacker & Small, 1990). Animations are popular objects that users encounter frequently, if not all the time. They have been used for different purposes and can be found in many computing environments, especially Web pages and online advertisements. Some designers use animations to convey messages, believing they are more powerful than text within a limited display area of a computer screen (Gonzalez & Kasper, 1997), although there are cautions regarding animations' efficacy (Tversky, et al., 2002).

Animations have long been promoted as an even more compelling way to educate users by showing the dynamics of user interface actions. However, the research results have often surprised and frustrated the promoters of animations, since it is rare to find measurable benefits for users of animations (Morrison, et al., 2000). User satisfaction with animations is usually high, but animations appear to distract users from concentrating on key issues (Weiss, et al., 2000).

It seems that to most people and at most times, animations on the Web are disturbing and annoying. Being interrupted or having one's attention involuntarily shifted by animation on a Web page is a typical experience for many Web users. This is especially so when animations carry information that has nothing to do with viewers' tasks and needs at the time. Zhang refers to this type of animation *as non-primary information stimulus* or *secondary stimulus* to users (Zhang, 2000). In other words, they carry no information for users' information-seeking tasks or immediate information needs.

Zhang believes that animations as non-primary information stimulus can create visual interference that affects one's information-seeking performance. Extraneous animation that is present continuously or appears suddenly can act as a distraction, interfering with users' concentration on pertinent information. Thus, it disturbs and often annoys people as they search for useful information on the Web, lengthening the time needed to obtain information correctly (Zhang, 2000).

Zhang study concluded that (1) Animation as a secondary stimulus deteriorates viewer information seeking performance. (2) As the difficulty of the task increases, viewer performance is less affected by animation. (3) Animation that is similar but irrelevant to a task has more negative impact on viewer performance than animation that is dissimilar to the task. (4) Animation that is brightly colored has a stronger negative effect on viewer performance than does dull colored animation (Zhang, 2000).

Macromedia Flash is another feature which has been employed by a significant number of Web sites around the world. Many commercial and personal Web sites use it in one way or another. Flash is a proprietary standard for video, multimedia, and applications from Macromedia. Since the year 2002, Macromedia has encouraged Web designers/developers around the world to use Flash MX to create Web sites entirely in Flash. However, the benefit of switching the Web from HTML-based to Flash-based is still obscure. Although Flash technology enables more application-like Web sites and higher integration of animated contents, the usability of Web sites created entirely in Flash has not yet been determined (Piyasirivej, 2005).

3. Animations Studies in Literature

Research results from studies in visual attention and perception can provide a plausible explanation for the disturbance phenomenon. Studies show that in general, objects in our peripheral vision can capture our attention (Driver & Baylis, 1989). Because attention has limited capacity, the available resource for attention on the pertinent information is reduced, thus information processing performance, including time and accuracy, deteriorates (Spieler, et al., 2000).

Since our ability to attend to stimuli is limited, the direction of attention determines how well we perceive, remember, and act on information. Objects or

information that do not receive attention usually fall outside our awareness and, hence, have little influence on performance (Proctor & Van Zandt, 1994). Perceptual attention is usually studied with two primary themes: selectivity (conscious perception is always selective) and capacity limitations (our limited ability to carry out various mental operations at the same time), although a variety of other notions are also studied (Pashler, 1998). Specifically, attention has been studied from two perspectives in order to understand different aspects of attention: selective attention and divided attention.

Studies regarding the impact of flash on users also reported in the literature. Piyasirivej believes that the "Flash everywhere" phenomenon is becoming more and more popular with Web site developers. However, it is commonly found that many Web designers/developers do not utilise a combination of Flash and HTML, as per the criteria above, but instead, they use only one or the other for the entire Web site. This might be because they consider that it would take longer to develop a Web site by interweaving the two approaches. Flash technology is considered as an alternative platform for the delivery of Web content (Piyasirivej, 2005). Users reported more enjoyment of the Flash sites than the HTML sites.

Hu, et al., (1999) examined the impact of interface designs on the perceived relevance of an object in an information-retrieval system. These researchers found that graphical interfaces were significantly superior to list-based interfaces, especially in communicating concepts of interest to a user. The study suggested that multiple visual properties included in an interface may increase user satisfaction.

Similarly, van Oostendorp and van Nimwegen (1998) measured users' speed and accuracy in locating information in online newspapers, finding that it took longer to locate information by scrolling and using hyperlinks between levels within a Web site (i.e., features more typically found on HTML-driven sites) than by directly linking a user to desired information (which is more typical of Flash). Furthermore, Spool et al. (1998) found that the use of graphic-laden interfaces had no correlation -- either positive or negative -- with users' ability to retrieve information; that is, graphic design was unrelated to the ability to find information on a Web site.

Rajani and Rosenberg (1999) found that users enjoyed novel Web sites; research participants indicated that the new technologies were both interesting and fun to use. They particularly liked the way sound enhanced their experience. These findings indicate that many of the features available through Flash-enhanced sites might actually increase (or at least not hinder) information retrieval.

A study by Raney and et al (2002) reported that users more enjoy of the Flash sites than the HTML sites. This finding is further substantiated by a single item that asked the respondents to identify which site they preferred more: 85.9 percent identified the Flash site.

Another study by Hong, et al., (2004) confirmed that flash does attract users' attention and facilitates quicker location of the flashed target item in tightly packed

screen displays. However, there was no evidence that attracting attention increases recall of the flashed item, as is generally presumed in practice, and may even decrease the overall recall. One explanation is that when users have to use their limited attentional resources on suppressing the distraction of flash, they will have less mental resources to process information. Moreover, the results suggest that processing information about an item depends not only on the attention it attracts per se, but also on the attention that other items on the same screen attract. While flashing an item may not increase the recall of that item, it can reduce the recall of other items (especially the nontarget items) on the screen. Finally, flash had negative effects on users' focused attention and attitude towards using the website (Hong, et al., 2004).

The results of a study by Piyasirivej (2005) suggested that both Flash and HTML have their advantages and disadvantages, and users tend to comment more positively on Flash version than on HTML version of Web sites. However, the significance of this finding can only be confirmed by further research.

4. Messages through Literature

According the literature, the following guide lines can be considered for better animation in the Web.

- Animation should be drawn to the essential features of an animation, so that users focus on the relevant aspect of the animation. It will be useless to draw animation on salient and unessential information.
- It is necessary to give appropriate time to exposure. The human eye takes time to process change and rapid exposures simply divide the brain's attention between the previous image and the current one.
- The Colour should be used primarily to discriminate objects or aspects of objects that are relevant. Irrelevant differences in colour can distract and mislead users; colours used should provide additional representational information for a particular animated concept.
- Animation should not be used alone because of its risk of ambiguity through differing user interpretations. The use of text, sound and possibly, narration, can provide constraints to the interpretation of any animation.
- Animators should also appreciate the need to use appropriate levels of abstraction. Animations should not contain objects or actions which are so detailed that they cause information overload.
- Use of flash can be recommended because users reported more enjoyment of the Flash sites than the HTML sites.

5. Conclusion

Animations are popular objects that users encounter frequently, if not all the time. They have been used for different purposes and can be found in many computing environments, especially Web pages and online advertisements. There are some guide lines which can help Web designers to prepare better Web pages. These guide lines have

been traced in the literature. While we are not sure about future, but it seems that the use of animations will continue. It may offer many possibilities for future studies.

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