

Attention Tracking - Measuring the focus of attention

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Abstract: As in advertising, online information works best if the users instantly realize the message conveyed. There is no easy to use and valid method for measuring what the viewers actually perceive and which elements are eye-catching. The eye tracking method can measure the physiological movement of the viewers' eyes but not what information the viewers process, store and recollect consciously. A new method called attention tracker® was conceived to measure the actually perceived elements on Web pages, advertising media, instruction manuals etc. The attention tracker® allows to identify the conspicuous elements and the ranking of their conspicuity. Based on the results, the clarity of the message, corporate design and branding can be improved, and the usability of Web pages can be optimized efficiently and in short time. The attention tracker® is applicable in usability testing, branding studies or rating of design proposals.

Keywords: Media; Perception; Attention; Branding; Usability Test

1 Introduction

The function of Web design is to transport the message. In many cases though, this purpose is not matched. One reason for this is the fact that the important elements on the Web page are not perceived as such. Flashy advertising banners, colorful pictures and other items which attract the users' eye may interfere with the intended communication goals.

What are the elements that attract the users' attention on the Web page? There are no appropriate or easy to use methods for answering this question. Eye-tracking is the method currently used in advertising and usability testing. The weak point of eye-tracking is the need for supplemental interpretation of the measurements by a specialist. Tests have shown that the interpretation of the eye-tracking patterns sometimes does not match the reports of the subjects of what they actually "saw"

or perceived. Furthermore, studies show that people report having "seen" elements which they have never physiologically looked at according the eye-movement-trace (see Lür, Lass, & Shallo-Hoffmann, 1988). Seeing and perceiving is not the same, therefore eye-tracking does not yield a valid answer to the question mentioned above (see Schroeder, 1998a; Schroeder, 1998b).

Therefore, a new method for analyzing what the viewers see and perceive on Web pages, posters and instruction manuals was conceived. Instead of measuring the physiological movement of the eyes of the users, the new method aims at measuring what the viewers see, process and interpret.

2 attention tracker®

As a result the attention tracker® was conceived and implemented. The attention tracker® is based on an easy to handle software. The set-up process for a test is very short and there is no interpretation

needed for the results gathered with this method. Overall, the attention tracker® allows to measure what users perceive very efficiently. It is the users' focus of attention which is measured instead of the physiological eye movements.

The basic principle for this approach is the human information processing system. When looking at a Web site almost immediately all information presented is stored in the sensory register. With the exception of the information which draws the attention from the user, the information is lost again. The remainder is processed further and kept in the working memory. Only then the information reaches consciousness. In consequence, conscious information can be verbalized by the test person (see Anderson, 2001; Baddeley, 1997; Goldstein, 2002).

The way in which the first or most eye-catching element is perceived influences also the perception of all other elements on the Web page (primacy effect, see Baddeley, 1997). Accordingly, the attention tracker® analyzes the eye-catching elements and allows to establish a ranking of the more and less important elements on i.e. Web pages. Based on these results, the visibility of essential hyperlinks, the clarity of the message, the quality of the corporate identity or brand can be easily and efficiently optimized.

The attention tracker® prototype software can be parameterized in order to control the presentation of the Web site's screen shot or any advertising media tested. The test object is presented five times to the subjects. The first presentation lasts only a fraction of a second. The following presentations have an increased presentation time in order to allow the subjects to gradually build up their overall picture of the test object. After each presentation the subjects are asked to report everything they perceived on the screen. The observer records the statements from the subjects. The presentations are pre masked to disperse the subject's focus and post masked to reduce the persistence of the picture.

The analysis of the subjects' statements yield information on the frequency of how often the more obvious elements were seen and perceived and on the ranking of the most eye-catching elements in the test object.

3 Testing the Method

In a research project, the validity and reliability of the attention tracker® method was tested. The question was whether the attention tracker®

actually does measure the focus of attention of the viewers (validity) and whether it yields the same results for different subjects (reliability).

The hypotheses were the following:

- There are elements on a Web site which are perceived more often than others.
- There are elements on a Web site which are perceived in earlier presentations than others.
- The more obvious an element is, the earlier this element is perceived during the course of the attention tracker test.

The new method was tested with 23 subjects on the basis of four different Web sites (www.ejpd.admin.ch, www.exlibris.ch, www.graubuenden.ch, www.srk.ch). The records of the 23 persons have been compared in terms of frequency of the perception and point of time of first seeing the element. For this purpose the elements were defined based on the statements of the subjects.

4 Results

The Results confirm the first two hypotheses:

1. There are significant differences between the various elements in terms of attention given to them by the viewers (see table 1).

2. The point of time when elements were perceived differs significantly between the more and the less obvious elements on the test objects (see table 2).

Concerning the third hypothesis there is a significant correlation between the point of time when an element was perceived and the conspicuousness of the element itself at least in some of the Web sites tested (see table 3).

Web site	Number of elements on Web site	df	X ²
Site 1	13	12	26.84**
Site 2	15	14	48.73***
Site 3	10	9	37.89***
Site 4	14	13	41.48***

Table 1: X²-Test of the deviance from a random distribution of the frequency of perceived elements. (significance level: *<0.05, **<0.01, ***<0.001)

Web site	Number of elements on Web site	df	X ²
Site 1	13	48	141.77***
Site 2	15	56	90.71**
Site 3	10	36	107.24***
Site 4	14	52	172.76***

Table 2: X²-Test of the deviance from a random distribution of the point of time when the elements were perceived. (significance level: *<0.05, **<0.01, ***<0.001)

Web site	Number of elements on the Web site	Pearson Correlation
Site 1	13	0.439
Site 2	15	0.558**
Site 3	10	0.521
Site 4	14	0.764***

Table 3: Test of the Pearson Correlation between frequency of perceived elements and point of time when the elements were perceived. (significance level: *<0.05, **<0.01, ***<0.001)

5 Discussion and Conclusions

The results show that the attention tracker® is a valid and reliable tool for measuring the focus of attention on Web sites, advertising media, instruction manuals etc. Using the attention tracker®, elements that are eye-catching or which the users look at first can be easily and effectively identified.

The attention tracker® can be used for optimizing not only the usability of Web sites and instruction manuals. It can also help in optimizing advertising media or prototypes before most of the project's budget is spent and necessary changes are impossible for economic reasons. The attention tracker® itself is cost saving because it does not require expensive hardware and long expert hours for interpretation.

6 Outlook

The next step will include the optimization of the tool itself and the implementation of a suitable and easy to use program to record the users' statements online during the test. The specifications of the recording software includes the direct evaluation and statistic analysis of the users' statements.

7 References

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