Impacts Of Location And Animation On Internet Banner's Clickthrough Rates

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Abstract

Internet banners have been under examinations in order to learn which design features could lead to high rates of clickthrough. Previous research has reported effects of banner animation and banner location; however, results are still inconclusive. This study thus attempts to compare clickthrough rates (1) between those on animating vs. stay-still banners and (2) between those on banners placed on top vs. in the middle of a screen.

Data from a quasi experiment confirm (1) the difference between the clickthrough rates on animating banners and those on stay-still banners is not significant, but (2) the difference between the rates on banners positioned on the top and those positioned in the middle of the screen is statistically significant at a 0.05 level.

In addition to extending insight into design issues of Internet banners practicing in Thailand, practitioners could adjust their online advertising campaigns based on the study's findings.

Keywords: Internet banners, animation, location, clickthrough rate, quasi experiment.

1. PROBLEM STATEMENT

According to several estimates, online advertising revenue will (1) outperform typical broadcasting channels, and (2) be at least US\$ billion in 2011 [15]. Among various forms of this online commercials, banner advertisement has become one of the most common formats [5]. The banner advertising refers to a display of marketing messages in any form of presentation that appears on a computer screen while ones visit a webpage [18].

Given the standard tools for online advertising campaigns, banners have received remarkable attention on design issues [14, 29]. That is, both researchers and practitioners would like to know the best design that could significantly contribute to the banner's high effectiveness. Among a few indicators in a banner effective matrix [12, 24], a clickthrough (or a clickthrough rate) has been commonly accepted because of its valid reflection of advertising success and its simple measurement. Defined in this study, the clickthrough is the number of click a banner has received. It could be measured per a time interval (e.g., the number of clicks per hour) or per a campaign (or a project). The clickthrough rate is then the number of click divided by the number of those who had (1) visited the page in which the banner appeared and (2) presumably seen the banner.

Past research has examined a few number of design features that may lead to a banner's high performance [5, 7, 11, 20]. Two of those features particularly of this study's interest are banner location and banner animation. This banner location refers to different positions on a screen where a banner appears. Given a banner's commonly rectangular shape, five locations could be on the top, the bottom, the left, the right, or in the middle, of a webpage or the screen. Based on Nichpornkul's [18] lab experiment, a banner on the top received the highest numbers of clicks, compared to the bottom, the left and the right locations. Tangmanee and DejArkom's [27] field experiment was based on Nichpornkul's findings. Attempting to compare clickthrough rates between those on the top position and those in the middle location, they was able to confirm that the top location still received the higher clickthrough rate than those at the middle position. Although these two projects of Nichpornkul's [18]; and Tangmanee and DejArkom's [27] are useful, they seem outdated, thereby, having validity concern. More recently, Zhang [31] compared the effect from banners positioned on the left and that from banners positioned on the right on information-seeking task. Although far from online commercial task, Zhang [31] discovered that the left location had more serious negative effect on the task than the right location. Ryu and coworkers [24] found, based on their controlled experiment, that visitors admitted the banners on the left position were more likable than those on the right position. In addition, Owens and coworkers [20] attempted to verify the banner blindness condition using eye-tracking devices and found that the right location were missed more often than the ones on the top position. Since Zhang's [31, 32] projects were on the information-seeking setting and Ryu and coworkers' [24] work employed a consumer's preference on banner as an indicator for advertising success, the question on which location Internet banners could earn the highest numbers of clicks remains unanswered. Given the controlled lab experiment's major drawback on

validity issues, we had contacted a number of websites to see a possibility of running a field experiment. A few actual websites we contacted accept to place on their homepages only the banners positioned along the screen's horizontal level. According to these webmasters, the screen's left section is typically reserved for menu placement. In addition, they discouraged us to choose the right location since visitors may set their screen differently and there then is a chance that a banner could be off screen on the far right. As a result, our focus in this study is on the top and the middle locations. This decision was also based on findings in a number of reports [18, 20, 27]. We excluded the bottom location since the banner on this location will appear last or after other sections on screen have been loaded. The bottom banners might thus gain visitors' least attention.

Based on previous research [14, 31], banner animation is defined as motion of any kind visually appearing on a webpage and this motion is visually associated with the banner. In general, animation could make a banner look "cool" [14]. Yet, it could be annoying and distracting [19]. Nonetheless, a banner often employs animation mainly in order to draw a visitor's attention with hope that the visitor will eventually click on it. Indeed, past research has confirmed this effect to some extent. Hong and colleagues [13] found that flash animation "does attract user's attention (p.60)." Yet, in the same study, they also confirmed that the visitors were unable to recall the content presented via the animation. Also, Cho and coworkers [8] discovered that the higher forced exposure to animated banners may lead to the higher clickthrough rate. Similarly, Chandon and Chtourou [34] confirmed the significant effect of animation on a clickthrough rate, although the effect amount is marginal. Chen and coworkers [7] found that animation on banner leaded to visitors' favorable attitude.

However, findings from past research seem to confirm the negative effect of animation. Hong and colleagues [13] found that flash animation in an e-commerce setting could not enhance recall of what appears on the banner. In addition, the effect of this flash animation depends on the tasks visitors have during online session and their experience [13, 28]. Highly experienced visitors tend to overlook at animation and concentrate on the banner content better than the novices [10]. Zhang [31] confirmed that animation significantly deteriorated information-seeking performance. In her other experiment, Zhang [32] validated that (1) the timing of animation (e.g., appearing at the beginning or task or popping up later) and (2) the rhythm of animation (e.g., staying on during the whole task or appearing on-off repeatedly) had

significant impact on performance of those information-seeking task. However, Hong and coworkers [13] identified two minor flaws in Zhang's [32] work. Her tasks and her animation seemed unrelated to online commercial. Also, subjects in Zhang's [32] work had to deal with the large number of tasks which thereby could deteriorate their performance, in addition to those from various conditions of animation. Even though a few studies confirm the effect of animation on online advertising performance, Yoo and colleague [33] indicate its ceiling effect. That is, if content is too much animated, the banner may not at all attract visitors' attention. Some visitors admitted they hated those banners with the high amount of animation. Moreover, based on their experiment, Sundar and Kalyanaraman [26] ascertained that slow animation was related to viewers' more favorable attitude than quick animation.

Drawn from previous literature, deploying animation is however still effective in attracting viewers' attention or even increasing their arousal. However, how to apply it in order to gain the high rate of clickthrough seems much challenging. Past research has reminded us to some extent about the timing, the rhythm or the amount of animation on the banner content [26, 27, 30, 32]. Yet, their results are still inconclusive. Hong and coworkers [14, p. 1467] was among the first attempts to focus on "non-banner-ads animation." According to them, the effect of animated banner content could be confound by animation around the banner, set aside viewers' perceptual and cognitive traits. They confirmed that this non-banner-ads animation did attract viewers' attention. Following Hong and colleagues' [13] suggestion, we decided to validate what the effect would be if the banner itself is animated but its content remains unanimated. Examining the effect of animating vs. stay-still banners, together with that of its locations (e.g., top vs. middle locations), on clickthrough rates is thus the study's unique contribution to the field of online advertisement.

2. OBJECTIVES

Based on our elaboration in the previous section, here are the study's two objectives:

- To compare clickthrough rates between those on banners positioned on the top and those on banners positioned in the middle of screen, and

- To compare clickthrough rates between those on animating banners and those on stay-still banners.

3. RESEARCH METHODOLOGY

Responses to the study's two objectives are from a field experiment. In a real setting, we attempt to do our best in manipulating two independent variables (i.e., two banner locations and two conditions of animation) and controlling other variables (e.g., banner content or a website hosting this banner) while observing whether the differences in a dependent variable (i.e., clickthrough rate) would be statistically significant. Unlike previous studies that measured the intention to click, we develop software to calculate the actual rate of clickthrough.

The following sections detailing methodological issues are (1) the hosting website and the banner, (2) experimental units and data collection, (3) reliability and validity issues, and (4) data analysis framework and hypothesis statements.

3.1 The hosting website and the banner

With collaboration from dusitcenter.dusit.ac.th, we were able to place banners in this website during mid-October to mid-December in 2010. Once we had the website agreement, we started the development of these banners. According to the two independent variables: banner location and banner animation, the design of banner must be nearly identical across values of these independent variables. This identical design is to enhance the experiment validity. That is, if the clickthrough rates are significantly different, it must be a result of the banner animation or the location, but not that of other uncontrolled factors.

Given the educational institute website (dusitcenter.dusit.ac.th), we decided to use the banner to advertise the school's sports facility. Basically, the banner would have a static, horizontally shaped, and embedded design of the 490*80 pixels. Its development was via Adobe Photoshop CS3 and Adobe Flash CS3 as designing tools. Figure 1 illustrates this basic design. To manipulate two locations of banner, we place the banners on the top and in the middle locations of the website homepage as seen in Figures 2 and 3.

Regarding the animation, our focus is not to animating content on the banner since a fair amount of past research has not been able to validate this effect (Tangmanee & DejArkom, 2003). We therefore speculate that the amount of animation, if occurring to only its content, is not so drastic to lead one's attention to an eventual click on the banner. Consequently, we attempt to increase the amount of animation to the extent to which the banner itself is animated. The banner in this study is thus shaking for two minutes in every five minutes of its display. Once shaking, the left and the right tips of the banner in Figure 1 will swing up and down for about 15 degrees, much like a seesaw board. A small survey with 25 graduate students confirmed that they all noticed the animation and accepted the idea of an animating banner, its content.

3.2 Experimental units and data collection execution

Experimental subjects in this study are actual visitors to the dusitcenter.dusit.ac.th website during the two-month data collection. Although we may not have much control over the subject recruitment, the actual context of this experiment would enhance the study's external validity [1].

Nevertheless, we were able to manipulate the display of banners. These banners have four similar designs (2 banner locations x 2 banner animation). We had developed program to (1) manage the display of these banners and (2) record the number of visitors and the number of clickthrough, on which we subsequently calculate the clickthrough rate. This program will manage the banner display so as to minimize any chance of bias. Suppose we display one of these four styles of banner during the weeks of course adjustment at this dusit college when most of students must access to this website for possible course changes. It is thus more likely that this style of banner receives the relatively high rate of clickthrough. Yet, this high rate is not a result of different locations or different animations. Therefore, the program will select one of the four banners in random to display during six hours of one day. The display order is also in random. It then means within a day the four styles of banner will have comparable chance to appear on the hosting website and the experiment will run for about 60 days or two months. This would finally yield the total of 360 hours to display each style. During each six-hour session, the program will examine a visitor's IP address. Then, it will check if there is any visitor from this IP address within the past 30 minutes. If this is true, the program will assume this visitor is the same person who had visited the website during the last 30 minutes and the program will not record this visit. Should the visitor be new, the program will add one visitor and will wait for this visitor to click on a banner within the first 30 minutes of his visit; otherwise, the program will record no click from this visitor. The 30-minute interval used to determine (1) if a visitor is new and (2) if a visitor is going to click is from past literature [6, 23].

Figure 1: The banner's basic design

Figure 2: The banner placed on the top location

According to the experimental condition, there exits possibility that (a) there are visitors but none clicks on a banner or (b) there is no visitor during the six-hour session. Indeed, 3,812 out of 8,640 records from the entire experimental sessions had no visitors. This is the condition under which a calculation of a clickthrough rate is impossible. This thus leaves us the total of 4,828 valid records for further analysis.

3.3 Reliability and validity issues

We strived to conduct a fair experiment in an actual setting in order to validate the impact of (1) two banner locations and (2) two banner animation patterns on a clickthrough rate. We had developed software program to place banners in the manner that could yield reliable and valid data for the validation. Such our effort include the followings.

Instead of having a lab-controlled experiment, we opted to do a field experiment with support from one actual website. The main reason that a lab setting was not our choice because the condition in the lab seems very artificial. For instance, we had tried to figure out what task we want subjects to do in the lab that could replicate actual use of the Internet but none of the solutions work well. So, we believe this field experiment would offer more valid conclusion than the lab setting.

Figure 3: The banner placed in the middle location

Given a variety of browsers, we decided to have a simple embedded banner with static design accessible through by major browsers (e.g., Internet Explorer, Firefox, or Chrome). This is in order for all visitors to be able to visit, enjoy contents on the hosting website and perhaps click on the banners. Had visitors dropped by the website but they had been unable to see the content or to click for inaccessibility reason, the conclusion about the effect could have been distorted.

We managed the experiment conditions via the software program so the display of all four-style banners could be part of an unbiased experiment. All four designs could then appear fairly in all sessions during the two-month data collection. Any bias due to the time of appearance was minimized. Using ASP.NET, the program is embedded in a reliable service that could accommodate the C# language and the ACCESS database management system. In addition, it would be improper to assume that the click will take place in a short moment after the visit. As such, we allow a 30-minute interval for this. Should a visitor not click on a banner during the first 30 minutes of his visit, it would be reasonable to assume that he will never click [23].

3.4 Data analysis and hypothesis testing

We will present the overall picture using descriptive statistics. To respond to this study's two objectives, we intend to test two hypotheses that attempt to verify if the clickthrough rates are statistically significant across (1) two banners located on top, and in the middle, of a webpage and (2) two patterns of animation (i.e., animating vs. stay-still banners). The statistical analysis technique would be the independent t-test. However, if the clickthrough rate is not normally distributed, we must opt for a nonparametric test which is the median test.

4. RESULTS

The two-month field experiment that displayed four styles of banners on dusitcenter.dusit.ac.th yields 4,828 usable data records for the analysis. Based on Table 1, the average of a clickthrough rate is 0.007591 or 0.7591%. That is, at least one in 200 visitors had clicked on a banner. Compared between two conditions of animation in Table 1, 0.8834% and 0.6375% are the average of clickthrough rates on animating and stay-still banners, respectively. Similarly, 0.4643 and 1.0483% are those on banners located on the top and in the middle, of the webpage, respectively.

Prior to testing hypotheses, we examined whether the clickthrough rate is normally distributed. Results in Table 2 confirmed that the distributions

are not normal. We therefore had to rely on a median test to test if the difference of clickthrough rates between those on animating banners and those on stay-still banners is statistically significant. The test's P-value is 0.921, indicating that the difference is not significant. However, the same test to verify if the difference between clickthrough rates on top banners and those on middle banners has the P-value of 0.001,

indicating that this difference is statistically significant at a 0.05 level.

Note that among the total of 8,640 records from the experiments, only 4,828 are usable. The unusable records are from the sessions in which there was no visitors. This thus suggests that 44% of the display sessions were idle, having no visitors to the hosting website.

Table 1: Descriptive statistics of clickthrough rates, categorized by banner locations and banner animations

Variables		N	Average	Standard deviation
Animation:	Animating	2,441	0.008834	.00164
	Stay-still	2,387	0.006375	.00121
Location:	Top	2,437	0.004643	.00113
	Middle	2,437	0.010483	.00168
Total		4,828	0.007591	.07071

Table 2: Results of testing distribution of clickthrough rates

Conditions		Kolmogorov-Smirnov Statistics	df	p-value
Animation:	Animating	.526	2441	.000
	Stay-still	.527	2387	.000
Location:	Top	.524	2391	.000
	Middle	.528	2437	.000

5. CONCLUSION AND DISCUSSION

A field experiment to examine the effect of animation and location on Internet banner's clickthrough rate took place for almost two months on one educational website in Thailand. The banner featured on the website's homepage was about the school sports facilities. This yields 4,828 records of data for the examination. In overall, the clickthrough rate is 0.7591%, indicating that al least one in 200 visitors to this website will click on these banners. This figure seem trivial; however, it is consistent with past research findings. Hong and colleagues [14] discovered based on their controlled experiment that the average clickthrough rate is about 13%. Similarly, Li and Bukovac [16] discovered a 29.5% rate of clickthroughs in their controlled experiment. However, Siegal and coworkers [34] confirmed the significantly less rate. It was 0.4%. Therefore, this current study's finding is still in line with more recently studies employing a field experiment approach. Given the low rate of clickthrough, this finding would empirically add that an increasing number of visitors have became "banner blindness" [3, 20] for these declining rates of clickthrough. Together with this study's finding that 44% of our experiment sessions had no visitors, this would call for a serious examination

on (1) online advertising campaigns that could increase traffic at a website and (2) design issues that could draw a visitor's attention so strongly that he could eventually click on the banners.

The difference of clickthrough rates between those on animating banners and those on stay-still banners is not significant. Although this contrasts to our expectation, it seems to confirm that animation may not be able to earn the high number of click as commonly expected or if it could attract visitors' attraction, the effect might be too weak to drive them to click. This result is however consistent to much of past research [13, 22, 28, 32]. Although the findings of past research, have informed us of the possibility that animation may no longer have the magic, we still believe the animation should be immensely visible in order to drive those visitors who notice the animation to eventually click on them. This is the reason that we opted to animate the banner, not its content. In other words, the animating banner may have led to the high rate of clickthrough; but we fail to verify it in this study. There are two possible explanations. Either is the animation extent still less visible or the animation has absolutely no effect on this clickthrough rate. This urgently calls for further investigation.

The difference between the clickthrough rates on banners placed on the top of a webpage and the

rates on those in the middle location is however statistically significant. According to Table 1, it seems that the banners in the middle location received a slightly higher rate of clickthrough. This may then add to a body of empirical knowledge that the middle location in a webpage appear to catch a visitors' eyes so well that it further leads to the high rate of clickthrough.

Theoretically, the study's findings have extended insights into online advertising in the context of Internet banner campaigns among Thai targets. Especially, it is empirically evident that banner location could lead to significantly different rates of clickthroughs. Practically, the findings offer at least three recommendations for online media practitioners. First, the trivial difference of clickthrough rates between animating and stay-still banners may give a hint not to incorporate animation into the banner design, particularly when the cost of integrating it is expensive. Based on this study's finding, even the banner itself is animating, it still leads to approximately the same rate of clickthrough as that on stay-still banners. The online marketers might want to consider other options, even the animation is always visually appealing. Second, practitioners should try to secure a webpage's middle location for horizontal banner placement since the clickthrough rate on such location is significantly different from that on the top location. Finally, the finding in which 44% of this study's sessions had no visitors may suggest that practitioners concentrate more on how to increase the visitors or the traffic to the website. It might be beyond this study's scope to offer any valid recommendations on this issue. Yet, this high percentage could warn practitioners to be attentive not only to the click but also to the visitors.

The utility of this study could have been more noticeable, if it had not had two limitations. First, this study is limited in scope since it involves one actual website. The findings are valid on this scope. Any generalization to other websites should be made with high precaution. Future work on different website categories or other scope may shed more light on this issue. Second, although the two months of the experiment were long enough to offer valid experimental findings, we must admit that the longer period may be able to take into account the temporal effect. Thus, other research fellows may be interested in replicating the similar project covering a longer period of time in order to arrive at a more complete picture.

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