

Study on banner advertisement type and shape effect on click-through-rate and conversion

Eetu Kuneinen
Bangkok University

ABSTRACT

This comparative study explored web banner advertising type and shape effect on click-through-rate and conversion using Google Display Network. The aim was to help a case study company operating in mobile accessories industry to find the most suitable banner type and shape for their advertising goals. Prior literature has been focusing on click-through-rate, and conversion has been left out of much further attention, and their combined effect – total conversion rate – wasn't found reported previously in academic research. This study compared the effect of banner shapes, types, and combined shapes and types to click-through-rate, conversion rate and total conversion rate. The research method used was quantitative observation experiment and data was collected through the Google AdWords from Google Display Network, which the researcher had access through the case company's account. Data was collected from 14 days period. The findings showed levels of significance between types and shapes. Performance wise static banner type outperformed dynamic in all areas: CTR, CR and TCR. The best performing shape for CTR and TCR was square. The best converting shape was rectangle. Comparing combined type and shape showed that static square led to best CTR, second best CR, and best TCR. The best CR was recorded for static rectangle. Statistical tests showed that null hypothesis could be rejected for type CR and TCR, shape CTR, and most type and shape combined data, and that levels of statistical significance was found for most of these data.

Keywords: Web advertising, Banners, Google Adwords, Google Display Network, Click-through-rate, Conversion

INTRODUCTION

The importance of online presence for all businesses has become more and more vital for success. The internet has opened up the global markets for many industries that in the past were limited by the traditional distribution technologies. While television and newspapers still remain the two dominant mediums for advertising per spending with an annual Global spending of \$196 billion and \$91 billion respectively, online advertising with annual Global spending of \$83 billion and 15% annual growth rate is the fastest growing advertising medium (The Economist, 2011).

Traditional marketing is generally considered as a cost for a company, but when marketing in online environment is done well it is not a cost, it becomes an investment (Thomas, 2011, p. 2). There are several factors that differentiate online marketing from its offline counter part, but one major contributor for the success of online marketing is that the results are measurable. Once online marketing has driven a user to the website everything what the user does on the site can be tracked (Kaushik, 2010, p. 1).

The company participating in this research is based in UK, and provides an online shopping platform for mobile and tablet cover stickers also known as skins. They have recently built a new ecommerce platform and they would like to drive traffic to it and as a goal would like to have the visitor taking the first step of starting to design a skin. Also they would like to increase their brand presence in the UK market, so banner advertisement is their obvious choice. The need for the research came from the company as they are very keen to test which type and shape of banners they should use for their Google Display Network campaign.

In addition to its paid search engine listings Google provides advertising opportunities within a network of websites called Google Display Network (GDN) (Spindler, 2010, p. 5). The banner ads displayed on GDN can be various forms, such as static banners and dynamic (or flash) banners. From an advertiser's point of view it is quite difficult to choose, which type of banner would be the most suitable for their unique campaign's purpose. Creating one is costly and usually requires programming. For different industries the solution could be very different. Also depending on the goal of the campaign the choice could vary. Some campaigns could have been set up to increase brand awareness, some to drive more visitors to the website, some to have the visitors to sign up for a service, some to sell a physical product and so on.

The effectiveness of a banner advertisement has traditionally been measured with its click-through rate (Cho, 2003; Sigel, Braun, & Sena, 2008, DoubleClick by Google 2010), but this study has also taken conversion – a desired action done by the visitor in the advertisers website – and the combined measure of click-through-rate and conversion rate into consideration.

LITERATURE REVIEW

Web Advertising

Web advertising involves two and some times three types of participants, which according to Hai and Zhao (2010, p. 72) can be described in the following way: an *advertiser* is a company that wants to advertise online through popular websites. A *publisher* is a website that offers advertising placement for the advertisers. A *broker* is a third party that works between the advertiser and the publisher as an intermediary agent.

Web advertising and especially banner advertising has been widely studied since it first started to appear in 1994. Hofacker and Murphy (1998) interestingly found that the copywriting of the banner has an effect on the CTR. By using call to action e.g. “click here” the CTR could be significantly improved. Stone and Han (1999) discovered the behavior segmentation patterns in web advertising of certain companies in service industry. The conclusion was that most of the respondents agreed online advertisements to be more convenient medium for obtaining information about the company, but would not hurry their purchase decision because of the online advertising.

Sigel et., al. (2008) studied three different style banner advertising finding that 160 x 600 (wide skyscraper) resulted the best click-through rate. According to DoubleClick by Google report (2010) the click-through rates overall comparison were 0.09% and 0.10% for Dynamic and Static banners respectively. CTR comparison between static and dynamic (flash) banners was quite even in different banner sizes. The two sizes where static banner CTR was significantly higher were vertical rectangle 240 x 400 and square pop-up 250 x 250. The same report also compiled CTR comparison within different industries, which was more even between the two banner types.

AdWords have been previously used as a testing ground for several purposes, but the research has mostly focused on new algorithms and bidding systems on search network (Turnbull & Bright, 2008; Goel & Mehta, 2008; Devanur & Haynes, 2009). Paul Cheney (2011) reported a test on Marketing Experiments Blog for two different designs impact on CTR and conversion rate (CR). The results were very interesting as design A resulted 35% better CTR but overall lower CR and design B despite lower CTR resulted 88% increase in conversion. So the conclusion was that it's not the number of clicks but the quality of traffic that should be focused on. Vigneron (2012) reported recently in his web article about a small experiment related to conversion rates and how they negatively correlate to CTR. He also warned not to look too much about conversions as at the end its the volumes that create the profit and that the advertisers should find the middle ground where profit margins can be maximised. Vigneron compared 10 search ads that each had 10,000 impressions.

Measuring Web Advertising Success

For web advertising to be successful the advertisers need tools and measures in order to rate advertising success. Click-through-rate (CTR) refers to the calculation of how many times the ad has been shown and the ad has been clicked (Geddes, 2010, p. 500). The calculation is shown below:

$$\text{CTR} = \text{clicks} / \text{impressions}$$

Many companies use click-through-rate as such measure (Kaushik, 2010, p. 348), but other more sophisticated measures should be included, as it merely shows that the user has shown interest to the advertisement. This is not to say that CTR is not important as engaging the user and get them to visit the website is a major key factor to further measure their activities on the website. According to Kaushik (2010, p. 37) visitors form the bedrock of every calculation for web success.

Conversion rate (CR) refers to the calculation of the rate how many clicks have converted, i.e. performed a wanted action, on the website (Geddes, 2010, p. 500). The calculation of conversion rate is shown below:

$$\text{CR} = \text{conversions} / \text{clicks}$$

Kaushik (2010, p. 55) refers to conversion rate as one of the most important measures there is today to measure website success. Thinking of web advertising and web analytics today, and as covered in chapter one that everything is measurable in online environment, it makes a lot of sense to use measures beyond the traditional focus only on click-through-rate. As web advertising is paid advertising (at least in Google AdWords), including conversion rate as one of the measures makes perfect sense: at the end advertisers want to know how many of the users who saw the ad clicked, but also if they converted or not. Conversion rate is often used in web analytics, but combining CTR and CR into TCR (calculation below) takes the two figures into new level as in branding purposes the advertiser is interested in both, but also the total value of seen ad, clicked ad and converted ad.

$$\text{TCR} = \text{CTR} * \text{CR}$$

Google Display Network

Most people tend to associate Google advertising to search engines. However search is not the only way Google can display advertisers' ads. Google Display Network is the largest ad network in the World, reaching more than 80% of global internet users and thousands of advertisers (Google Inc., 2010, p. 1).

The ads can be shown to viewers based on the content of a website (Geddes, 2010, p. 226). For example New York Times (2011) published an article about law firms on their website. Below the article there are ads displayed related to the content – law firms in that case. These types of ads, which are titled “Ads by Google” belong to Google Display Network (GDN), previously known as Content Network (Geddes, 2010, p. 227), which got its kick-start from Google acquiring DoubleClick in 2007 and the car manufacturer Ford's successful experiment with Google on contextual banner advertising (O'Leary, 2010).

Banners, Copy and Design

Advertising banners are certain size displays on a webpage. By clicking the banner the user is taken from the existing webpage to advertisers webpage or other webpage where they can purchase the advertised product or service (Hofacker & Murphy, 1998, p. 704; Yoo, 2007, p. 9). Web advertising as every other advertising medium has its standards. The concept of online advertising originated from dividing its page-based mediums as units, which were set for space for online advertising. The spaces were small clickable buttons and banners which later expanded into various different sizes and shapes (Plummer, et., al, 2007, p. 81). There are several types of banners ads appearing today in addition to the traditional placed on a website to its allocated space, such as pop-ups, which pop on the screen in front of the web browser and pop-unders which pop behind the web browser (Yoo, 2007, p. 9). The Interactive Advertising Bureau, IAB, (2011) has set guidelines for standard banner ad sizes, which are:

1. 300 x 250 IMU (Medium rectangle)
2. 180 x 150 IMU (Rectangle)
3. 728 x 90 IMU (Leaderboard)
4. 160 x 600 IMU (Wide Skyscraper)
5. 300 x 600 IMU (Half page)
6. 120 x 60 IMU (Button 2)
7. 88 x 31 IMU (Micro bar)

Early studies show that an animated icon clarifies its purpose and invites a user to try it (Baecker, Small, & Mander, 1991; Dormann, 1994; Rist, André, & Müller, 1997), on the other hand some raise warning that animation should be haltable by expert users (Alpert, 1991). According to Cole (2008, p. 2) larger ads work better for all web advertising in terms of CTR most circumstances. Half page ad, large rectangle and medium rectangle are the top three performing sizes. Also some industry benchmarks for click through rates have been exposed (Cole, 2008, p. 3), which can be used to measure industry comparative performance. Some research has also been targeted towards the banner type. The market shares between used banner ad types according to (Cole, Spalding, & Fayer, 2009, p 2) in 2008 within DoubleClick were flash 55%, GIF/JPG 39% and rich media 6%. Dynamic seems to work better in aided brand awareness, where as static outperforms in online ad awareness and message association (Cole, Spalding & Fayer, 2009, p. 16).

Certain guidelines for banner copy best practices have been implemented. Using a call-to-action in a simple form has a great effect on CTR. Hofacker and Murphy (1998) tested four different headlines for a banner ad of which one was descriptive of the service, two were combinations of descriptive and call to action, and the last only call to action. The first one performed 2.87% CTR, the second and third 5.59% and 6.88% CTR, and the last one resulted 11.13% CTR. Moga and Tulbure (2010, p. 3-7) gave the following guidelines for banner ad copywriting: answer the question “what is my goal?”, target the ad copy to the right audience, imagine yourself in their shoes, be brief and use catchy words such as FREE, and finally also highlighted the importance of explicit and simple call to action.

This research was to set to fulfill a gap in the prior literature that is mostly click-through-rate focused and conversion hasn't been paid much of attention, as seen above. Especially from the advertisers point of view the conversion, and the joint effect of CTR and conversion, are equally if not even more important. The objectives of this research was to gain better understanding of banner type and shape total performance, and whether or not it makes a difference for the advertiser what type and shape he uses. Also, directly from the case study advertisers point of view, finding out which type and shape the advertiser should choose in order to meet the advertising goals was a top priority.

METHODOLOGY

Research design

Observation method approach was chosen to be used due to the reason that the researcher has easy access to UK data via the Google Display Network, also conducting survey would have been extremely time consuming and only rely on people's opinion or perceived effect. As the study wanted to dig into what the visitors actually do on the website, observation through internet-tracked data proved to be the best option. Also the researcher had easy access to the

studied sample case data.

Google Display Network provides the most covering advertising network in the World, reaching more than 80% of global internet users and thousands of advertisers (Google Inc., 2010, p. 1) and therefore proves to be the best fit for a banner comparison test ground the medium for collecting the data. It's much easier and more time saving to reach the wanted websites through Google Display Network instead of contacting the websites individually and setting up customized tracking systems and tools. Also GDN is the main advertising medium for the company involved and they already had account created there, which made it easy to collect the data. According to Babbie (2010, p. 251) the weaknesses of experiment method include artificiality; the experiment doesn't reflect to real world. However in this case it does not apply as the experiment is done in the real environment.

Model estimation and testing

The research model created for this study builds on three core elements: impressions, clicks and conversions, which form the funnel displayed in figure 1. Impressions are total a number of times an ad has been shown. Clicks respectively represent a total number of times the shown ad has been clicked. Conversions finally reveal the total number of a wanted action a visitor coming to the website through a click has performed. Their relations CTR, CR and TCR are percentage numbers that used for comparing the performance between the different banner ad shape and type. By using this model a comparative study can be designed in order to discover a best performing ad type and shape for studied case. The research model builds a process that enables comparing different banner advertisement by type and shape and mirroring the performance through the recorded impressions, clicks and conversions and the comparison tools; CTR, CR and TCR.

Based on this model the research questions can be answered and tested by comparing various banners with each other. Figure 2. shows the planned comparison between types and shapes. Two types, four shapes and eight shapes and types will be compared, which is demonstrated in figure 2. Types – static (S) and dynamic (D) – will be tested for which performs better in CTR, CR and TCR. Shapes performance for same criteria is tested for square (Sq), rectangle (R), horizontal (H) and vertical (V). Finally shape and type combined performance is compared with same criteria for eight variables: dynamic square (SqD), dynamic rectangle (RD), dynamic horizontal (HD), dynamic vertical (VD), static square (SqS), static rectangle (RS), static horizontal (HS) and static vertical (VS). This model is also used for data validation (ANOVA and t-test) in order to make sure the assumptions about mean variance differences hold. If $A=B$, the comparison fails to identify better performer and test fails, however chances are extremely small also and several test cases have been chosen to reduce the risk of test failure.

Method of inquiring data and data validation

The data used through out this paper was collected through an experiment from the Google Display Network within Google AdWords, for which the case company have account set up previously. Google AdWords user interface allows accurate tracking for metrics such as impressions (how many times the ad has been shown), clicks (how many times the user has clicked the ad). The system calculates CTR automatically. The company tracks conversions in their own database using cookie based tracking to validate the source of traffic, so that conversions can be linked to individual AdWords ads. Conversion is rate was then calculated

taking the clicks from AdWords and the conversions from the company database to which the researcher had access. Total conversion rate was then calculated by multiplying CTR and CR in order to distinguish how many users who saw the ad actually converted at the end.

Google Display Network system can be set to evenly rotate the ads under the same adgroup, and this setting was used throughout collecting the data to make sure the clicks would be recorded reliably between the different ads displayed under the same adgroup. A typical click-through-rate is between 0.06% - 0.17% (Cole, 2008, p. 3). A pretest day was used to test that data records correctly, which it did and data showed the averaged 0.12% CTR's for the total clicks.

The total number of impressions data collected was 1,600,000, which was 800,000 for each type, 400,000 for each shape and 100,000 for each combined type and shape. In Google online environment certain guidelines for successful testing has been set. In terms of clicks Geddes (2010, p. 421-422) recommends to obtain at least 300 clicks per ad, and at least 7 conversions, 15 if possible. For statistical testing purposes according to Taanila (2010, p. 1) statistical analyses can be run for sample size starting from 20, better if 50 and over 100 if possible. In this case these guidelines have been taken into consideration and the analyzed sample size for clicks varies between 51 and 661, and conversions between 30 and 497 and should therefore be sufficient for statistical analysis. Geddes (2010, p. 421) also recommends capturing a full purchase cycle of data, which can be as long as a month or as short as a week. The company in case identified their purchase cycle as maximum 2 weeks, which has been applied in this case. Also this allows of collecting data from different weekdays twice, which according to Geddes (2010, p. 421) is important because the behavior might vary depending on the weekdays.

To ensure the reliability for the data three different sources were used during collection of the data. Clicks can be viewed at Google AdWords and Google Analytics, which can be used to track absolute unique visitors, which according to Kaushik (2010, p. 44) is one of the most reliable tools to track it. Clicks in AdWords matched clicks in Analytics. Conversions were tracked only in the company database, as they have decided not to link it with Analytics. The conversions tracking was tested by performing test conversions, which recorded correctly in the company database; the conversions came from AdWords as a source and could be separated from conversions from other traffic sources.

In order to statistically validate that the data sets can be compared to each other level of significance for associations due only to sampling error will be tested. To make sure that the assumptions hold and that there is a significant difference in mean variance, analysis of variance (ANOVA) was done between different variables shown in figure 2. One-way ANOVA assumes that the average values of the response variable are effected by one factor, and the goal of ANOVA is to analyze the observation structure and whether there sample groups have the same mean effect or that they are different (Härdle & Simar, 2012, p. 93).

The method used to test this is to compute the total variation (SS) and to divide it into sources of variation, so that we have total variation between the groups and within the groups (Härdle & Simar, 2012, p. 94). The F-test is used to compare the difference in the variations under the H_0 and H_1 to the full model (Härdle & Simar, 2012, p. 94). df notes for degrees of freedom and are essential for specifying the F-distribution. F -value was be compared to F -critical value and $F > F$ -crit in order the data to show significance. ANOVA was run in Excel Spreadsheet using StatPlus add-in, which in addition provides the p -value to support the rejection of null hypothesis.

Level of significance used in this test was 0.05 in order to test against higher sampling error and to make sure that the data is valid. Confidence level refers to the estimated probability that the population parameter lies within the given confidence interval (Babbie, 2010, p. 206). For this study the confidence level is set to 95%.

As the data used in ANOVA in this case was percentages, it has been suggested that arcsin value transformation should be applied (Cardinal & Aitken, 2006, p. 67). Otherwise one would be measuring mean variance for values that are limited between 0-100, and the effect of ANOVA test would not be reliable.

RESULTS AND DISCUSSION

Banner performance for type

Type data contained total 16 observations and was grouped to two type groups. Eight observations for banners sizes were signed for each types – static and dynamic – and the group means compared for click-through-rate, conversion rate and total conversion rate. One-way ANOVA was ran in order to find out whether the result would have statistical significance or not, and whether null hypothesis could be rejected and the means would be statistically speaking shown different.

In terms of click-through-rate for type static (S) with 0.24% CTR outperformed dynamic (D) with 0.11% CTR by 106% in comparison. In prior research as reported in DoubleClick by Google report (2010) the click-through rates overall comparison were 0.09% and 0.10% for Dynamic and Static banners respectively. ANOVA test showed that the p-value is slightly larger than 0.05, therefore the null hypothesis cannot be rejected. The F-value is smaller than the F-critical value; there is not noted level of significance in the mean variance for type CTR.

Static (S) type with 75.20% CR outperformed dynamic (D) with 48.37% CR also in conversion rate comparison by 55% pointing that static type banner ad should be used to result higher conversion rate. ANOVA test results show that the p-value is significantly smaller than 0.05, therefore the null hypothesis can be rejected. The F-value is significantly larger than the F-critical value; there is high level of significance in the mean variance for type CR. There are no DoubleClick by Google conversion data available from prior research to compare these results with, probably due to the fact that every company has different definition for conversion that is not comparable and therefore makes it impossible to come up with industry standards. Also there is no prior research on conversion rates that would match with the case company's advertising goals therefore no comparison for prior research cannot be made. However Vigneron (2012) suggested in his report that a high CTR would lead to a low CR. In this case we cannot come to similar conclusion as the higher CTR for static also performed higher in CR.

In terms of total conversion rate static (S) with 0.18% TCR outperformed dynamic (D) with 0.05% TCR by 216% in comparison, which is a significant difference and indicates that static should be chosen over dynamic banner type. ANOVA test was run to the type comparison data for TCR. The results show that the p-value is significantly smaller than 0.05, therefore the null hypothesis can be rejected. The F-value is significantly larger than the F-critical value; there is high level of significance in the mean variance for type TCR.

Taking a closer look at the banner type results as a whole could easily be concluded that the advertiser should choose static over dynamic type as the performance showed better not only in click-through-rate (the ads would engage the users more), but also convert better at the end and therefore received higher overall click-through and conversion rate (total conversion rate). If

type would be the advertisers criteria these results would recommend the use of static banners over dynamic banners. However various banner ad shapes (and sizes) were used in data collection, and there might have been differences amongst the shapes within the type group performance had the data be looked deeper into. The following section will look more into different shapes performance.

Banner performance for shape

Shape data contained total 16 variables and was combined to four different shape banner groups – square (Sq), rectangle (R), horizontal (H) and vertical (V) – and compared for click-through-rate, conversion rate and total conversion rate. One-way ANOVA was ran in order to find out whether the result would have statistical significance or not, and whether null hypothesis could be rejected and the means would be statistically speaking shown different.

In terms of click-through-rate, square shape with 0.34% CTR was shown to perform best out of the four tested shapes. Square was 160% better than the tied second place between rectangle and vertical with 0.13% CTR. Horizontal shape with 0.11% CTR placed last with 18% lower performance to rectangle and vertical shapes with 0.13% CTR. Horizontal, rectangle and vertical, which performed 0.11% (0.08%), 0.13% (0.11%) and 0.13% (0.09%) respectively, and slightly outperformed DoubleClick by Google (2010) benchmark rates in brackets. ANOVA test results show that the p-value is smaller than 0.05, therefore the null hypothesis can be rejected. The F-value is larger than the F-critical value; there is enough significance in the mean variance for shape CTR.

In terms of conversion rate, rectangle shape with 73.67% CR was shown to perform best out of the four tested shapes. Rectangle was 16% better than the second best vertical with 63.44% CR. Square and Horizontal shapes, with 53.99% CR and 56.04% CR respectively, placed last with only 3.7% performance difference from each other. Again, there are no DoubleClick by Google conversion data available from prior research to compare these results with, probably due to the fact that every company has different definition for conversion that is not comparable and therefore makes it impossible to come up with industry standards. Also there is no prior research on conversion rates that would match with the case company's advertising goals therefore no comparison for prior research cannot be made. However we found similarities in results with Vigneron's (2012) report on high CTR leading to lower conversion. Highest CTR for square 0.34% lead to lowest conversion rate 53.99%, and lowest CTR for rectangle 0.09% lead to highest conversion 73.67%. ANOVA test results show that the p-value is significantly larger than 0.05, therefore the null hypothesis cannot be rejected. The F-value is significantly smaller than the F-critical value; there is not enough significance in the mean variance shape CR.

In terms of total conversion rate, square shape was shown to perform best out of the four tested shapes with 0.21% TCR. Square was 110% better in comparison than the second place rectangle with 0.10% TCR. Vertical with 0.09% TCR placed closely to rectangle with 11% lower performance in comparison and horizontal shape with 0.06% TCR placed last with 50% lower performance compared to vertical shape. ANOVA test results show that the p-value is significantly larger than 0.05, therefore the null hypothesis cannot be rejected. The F-value is significantly smaller than the F-critical value; there is not enough significance in the mean variance for shape TCR.

Looking at the banner shape results as a whole one could easily come to the conclusion that the advertiser should choose square shape over the others tested as the performance showed

better results not only in click-through-rate (the ads would engage the users more), but also for total conversion rate. The conversion played no significant role from statistical point of view and click-through-rate importance dominated the total conversion results. If shape would be the advertisers criteria these results would recommend the use of square shape. However these results don't take into consideration the banner type, which might have had a great impact on the final outcome. The following section will look more into combined types and shapes.

Banner performance for type and shape combined

Type and shape data contained total 16 variables and was combined to eight different type and shape combined banner groups – square dynamic (SqD), rectangle dynamic (RD), horizontal dynamic (HD), vertical dynamic (VD), square static (SqS), rectangle static (RS), horizontal static (HS), vertical static (VS) – and compared for click-through- rate, conversion rate and total conversion rate. One-way ANOVA was ran in order to find out whether the result would have statistical significance or not, and whether null hypothesis could be rejected and the means would be statistically speaking shown different.

Combined banner type and shape seem to have great impact on banner performance. It was clear from the test results what shape and type ad the advertiser should choose. In terms of click-through-rate there was one that clearly outperformed the others. Static square showed highest click-through with 0.47% rate. This number is significantly better than the industry average reported in DoubleClick by Google (2010) for static square 0.23%. Static square was followed by dynamic square with 0.22% CTR which in comparison to industry average 0.16% showed also better performance. Lowest CTR was recorded for dynamic rectangle 0.07% and the second lowest dynamic horizontal 0.08%. The comparison rates from DoubleClick by Google were 0.10% and 0.07% respectively. The rest of the tested placed in between these four groups with the following performance, industry average figures in brackets: static rectangle 0.18% (0.13%), static vertical 0.17% (0.10%), static horizontal 0.13% (0.09%), dynamic vertical 0.09% (0.08%). Out of all the tested groups only dynamic rectangle performed lower than the industry average. ANOVA test results show that the p-value is smaller than 0.05, therefore the null hypothesis can be rejected. The F-value is larger than the F-critical value; there is enough significance in the mean variance for combined type and shape CTR.

In terms of conversion rate static rectangle (RS) with 83.40% CR was the best performing followed by static square (SqS) with 79.36% CR with compared 5% difference. The lowest performance was from dynamic square with 28.62% CR that was 60% lower than the second last dynamic horizontal with 45.92% CR. There are no DoubleClick by Google conversion data available from prior research to compare these results with, probably due to the fact that every company has different definition for conversion that is not comparable and therefore makes it impossible to come up with industry standards. Also there is no prior research on conversion rates that would match with the case company's advertising goals therefore no comparison for prior research cannot be made. However from general comparison with Vigneron (2012) report on high CTR resulting low CR we cannot see similarities as the highest CTR led to second highest CR and second lowest CTR led to lowest CR. ANOVA test results show that the p-value is significantly smaller than 0.05, therefore the null hypothesis can be rejected. The F-value is significantly larger than the F-critical value; there is enough significance in the mean variance for the combined type and shape CR.

For total conversion rate the best performance was for static square (SqS) with 0.36% TCR, that was 140% better in comparison that the second place static rectangle (RS) with 0.15% TCR. At the lower end the two losers were dynamic horizontal and dynamic rectangle with 0.04% TCR. ANOVA test results show that the p-value is significantly smaller than 0.05, therefore the null hypothesis can be rejected. The F-value is significantly larger than the F-critical value; there is enough significance in the mean variance for the combined type and shape TCR.

Taking a closer look at the combined banner type and shape results as a whole one could come to the conclusion that the advertiser should static square and static rectangle over the others tested. On CTR side, static square was on top, followed by dynamic square and static rectangle. However dynamic square showed poor conversion, where as static rectangle and static square converted the highest leading to the best total conversion. Static square was the overall highest performing as, it showed highest click-through-rate (the ads would engage the users more), but also convert high at the end (the users would take the wanted action on the website) and therefore received higher overall click-through and conversion rate (total conversion rate). If type and shape would be the advertisers criteria these results would recommend the use of static square over the others tested.

IMPLICATIONS OF THE STUDY AND FURTHER RESEARCH

This research was set to support managerial decision making for the case company in order for them to decide what kind of banner advertising would result the most wanted outcome. Out of all the tested groups static square (SqS) banner ad outperformed the others. It showed the best click-through-rate 0.47%, which would drive the most traffic to the website and engage the users viewing the ads the most. It also reached incredibly high conversion rate 79.36%. The only group with higher conversion rate was static rectangle with 83.40%, but with lower CTR it loses the total conversion to static square. If the advertiser would have 10 000 impressions, it would send 47 users to the landing page, out of which 36 would take the wanted action.

However it would not be wise from branding point of view to exclude ads from sites that only allow certain size ads. Therefore the results would advise to spend the most on static square in order to reach highest total conversion, but also to advertise the rest of the shapes, but to use static ad type. Static out performed dynamic in all areas of CTR, CR and TCR. 10 000 mixed impressions for all static ads would lead to 24 clicks, and 18 total conversions.

Similar study could be conducted to other companies operating in the same area of business in order to see if the results are similar or are there any differences. Would be interesting to see if seasonality plays any effect on the results: longitudinal study could be conducted to test this. The same model could be taken into other industries and conversion defined as whatever goal the advertiser wishes to have. Including financial models into the tested area would be very interesting as the conversion could be a transaction. In that case ROI could be tested in order to find the best yielding banner ad type and shape. User purchase process could be identified and different phases of the purchase process could be tested and find out if there are differences in the ad effect at difference phase for the user. This leads also to the idea of remarketing test: ads would only be shown the users who have already done a certain action; e.g. visited the website, purchased a product from the website etc. If looking beyond the banner ads this type of study could also be conducted to paid search and the studied are could be keywords or text ad copy. Also testing different landing pages would be interesting

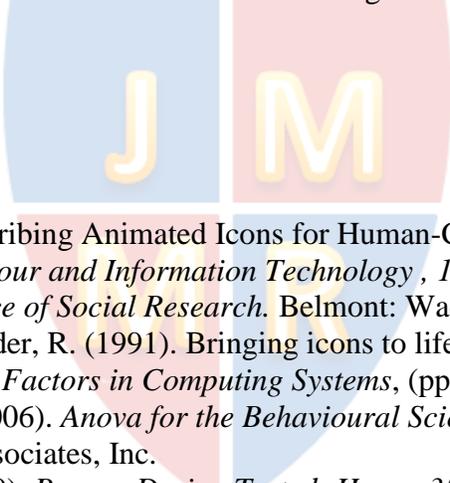
and not only lead to stronger web advertising results, but as overall improved traffic conversion. As Google is not the only advertising medium, even though it is the largest, others such as Facebook could be used to collect data. Facebook allows demographic user targeting that could lead into very interesting results.

CONCLUSION

This research was set to gain more understanding of banner ad performance, and in what way different factors (type and shape) effect it. Summary of the findings summarized what was found: static banner type outperformed dynamic in all areas: CTR, CR and TCR. The best performing shape for CTR and TCR was square. The best converting shape was rectangle. Comparing combined type and shape showed that static square led to best CTR, second best CR, and best TCR. The best CR was recorded for static rectangle. Statistical were summarized: null hypothesis could be rejected for type CR and TCR, shape CTR, and all type and shape combined data and that statistical significance was found for these data.

Methodology chosen was quantitative observation experiment and how the data was collected from Google Display Network was covered. Using ANOVA for statistical significance test was explained.

REFERENCE

- 
- Alpert, S. R. (1991). Self-describing Animated Icons for Human-Computer Interaction: a Research Note. *Behaviour and Information Technology* , 10 (2), 149-152.
- Babbie, E. (2010). *The Practice of Social Research*. Belmont: Wadsworth Cengage Learning.
- Baecker, R., Small, I., & Mander, R. (1991). Bringing icons to life. *Proceedings of CHI '91: Conference on Human Factors in Computing Systems*, (pp. 1-6).
- Cardinal, R., & Aitken, M. (2006). *Anova for the Behavioural Sciences Researcher*. New Jersey: Lawrence Erlbaum Associates, Inc.
- Cheney, P. (2011, September 9). *Banner Design Tested: How a 35% decrease in clicks caused an 88% increase in conversion*. Retrieved February 4, 2012 from Marketing Experiments Blog: <http://www.marketingexperiments.com/blog/analytics-testing/banner-design-tested.html>
- Cho, C.-H. (2003). Factors Influencing Clickers of Banners on the WWW. *CyberPsychology & Behavior* , 6 (2), 201-215.
- Cole, S. (2008, September). *Creative Insights on Rich Media*. Retrieved February 21, 2012 from DoubleClick.com: http://static.googleusercontent.com/external_content/untrusted_dlcp/www.google.com/en//doubleclick/pdfs/DoubleClick-09-2008-Creative-Insights-on-Rich-Media.pdf
- Cole, S., Spalding, L., & Fayer, A. (2009, June). *The Brand Value of Rich Media and Video Ads*. Retrieved February 21, 2012 from DoubleClick.com: http://static.googleusercontent.com/external_content/untrusted_dlcp/www.google.com/en//doubleclick/pdfs/DoubleClick-06-2009-The-Brand-Value-of-Rich-Media-and-Video-Ads.pdf
- Devanur, N., & Haynes, T. (2009, July 6-10). The Adwords Problem: Online Keyword Matching with Budgeted Bidders under Random Permutations. *ACM EC'09* .

- Dormann, C. (1994). The Design of Animated Signs as Help. *CHI '94 Conference Companion: Conference on Human Factors in Computing Systems*, (pp. 137-138).
- DoubleClick by Google. (2010). *2009 Year-in-Review Benchmarks: A DoubleClick Report*. Retrieved February 4, 2012 from Doubleclick.com:
http://static.googleusercontent.com/external_content/untrusted_dlcp/www.google.com/en//doubleclick/pdfs/DoubleClick-07-2010-DoubleClick-Benchmarks-Report-2009-Year-in-Review-US.pdf
- Geddes, B. (2010). *Advanced Google AdWords*. Indianapolis: Wiley Publishing Inc.
- Goel, G., & Mehta, A. (2008). Online Budgeted Matching in Random Input Models with Applications to Adwords. *SODA '08 Proceedings of the nineteenth annual ACM-SIAM symposium on Discrete algorithms*. Society for Industrial and Applied Mathematics.
- Google Inc. (2010). *CPA Performance Trends on the Google Display Network*. Retrieved February 22, 2012 from Google.com :
https://docs.google.com/a/google.com/viewer?url=http%3A%2F%2Fwww.google.com%2Fadwords%2Fdisplaynetwork%2FGDN_Whitepaper.pdf
- Hai, L., & Zhao, I. (2010). An Integrated Framework for the Design of Optimal Web Banners. *Netnomics* , 11, 69-83.
- Hofacker, C., & Murphy, J. (1998). World Wide Web Banner Advertisement Copy Testing. *European Journal of Marketing* , 38 (7/8), 703-712.
- Härdle, W., & Simar, L. (2012). *Applied Multivariate Statistical Analysis. Third Edition*. Germany: Springer.
- Interactive Advertising Bureau. (2011, February 28). *Ad Unit Guidelines*. Retrieved February 9, 2012 from Interactive Advertising Bureau:
http://www.iab.net/guidelines/508676/508767/ad_unit
- Kaushik, A. (2010). *Web Analytics 2.0 The Art of Online Accountability & Science of Customer Centricity*. Indianapolis: Wiley Publishing Inc.
- Moga, C., & Tulbure, D. (2010). *25 Best Practices in Banner Adverting*. BannerSnack.
- O'Leary, N. (2010, May 3). Ford, Google Experiment With Contextual Banner Ads. *Brandweek* , 51 (18).
- Plummer, J., Rapparot, S., Hall, T., & Barocci, R. (2007). *The Online Advertising Playbook: Proven Strategies and Tested Tactics from Advertising Research Foundation*. New Jersey: John Wiley & Sons, Inc.
- Rist, T., André, E., & Müller, J. (1997). Adding Animated Presentation Agents to the Interface. *Proceesings of IUI '97: International Conference on Intelligent User Interfaces*, (pp. 79-86).
- Sigel, A., Braun, G., & Sena, M. (2008). The Impact of Banner Ad Styles on Interaction and Click-Through Rates. *Issues in Information Systems* , 9 (2), 337-342.
- Spindler, S. (2010). *Online Marketing. How to Increase International Sales with Search Engine Optimisation*. Grin.
- Stone, J., & Han, J. (1999). Behaviour Segmentation in Online Advertising. *Journal of Marketing Research* , 4 (2), 55-61.
- Taanila, A. (2010). Lineaariset Regressiomallit [Linear Regression Models]. Haaga-Helia.
- The Economist. (2011, November 17). *The World in Figures: Industries: Media*. Retrieved February 6, 2012 from The Economist Online Edition:
<http://www.economist.com/node/21537948>

The New York Times. (2011, November 11). *What They Don't Teach Law Students: Lawyering*. Retrieved February 7, 2012 from The New York Times: Business Day: http://www.nytimes.com/2011/11/20/business/after-law-school-associates-learn-to-be-lawyers.html?_r=1

Thomas, L. (2011). *The McGraw-Hill 36-hour course: Online marketing*. New York: McGraw-Hill.

Turnbull, D., & Bright, L. (2008). Advertising Academia with Sponsored Search: An Exploratory Study Examining the Effectiveness of Google AdWords at the Local and Global Level. *Int. J. Electronic Business*, 6 (2), 149-171.

Vigneron, B. (2012, April 20). *Column: Search & Analytics - Conversion Rate Optimization In Paid Search: Why Click Through Rate Matters*. Retrieved April 20, 2012 from Search Engine Land: <http://searchengineland.com/conversion-rate-optimization-in-paid-search-why-click-through-rate-matters-118991>

Yoo, C. Y. (2007). *Preattentive Processing of Web Advertising*. New York: Cambria Press.

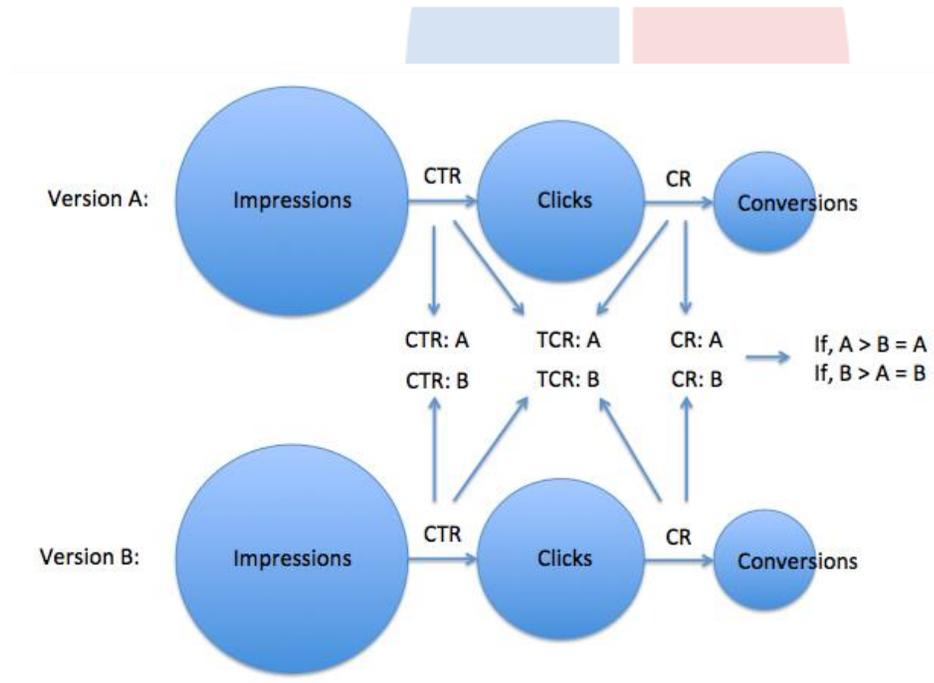


Figure 1. Research model

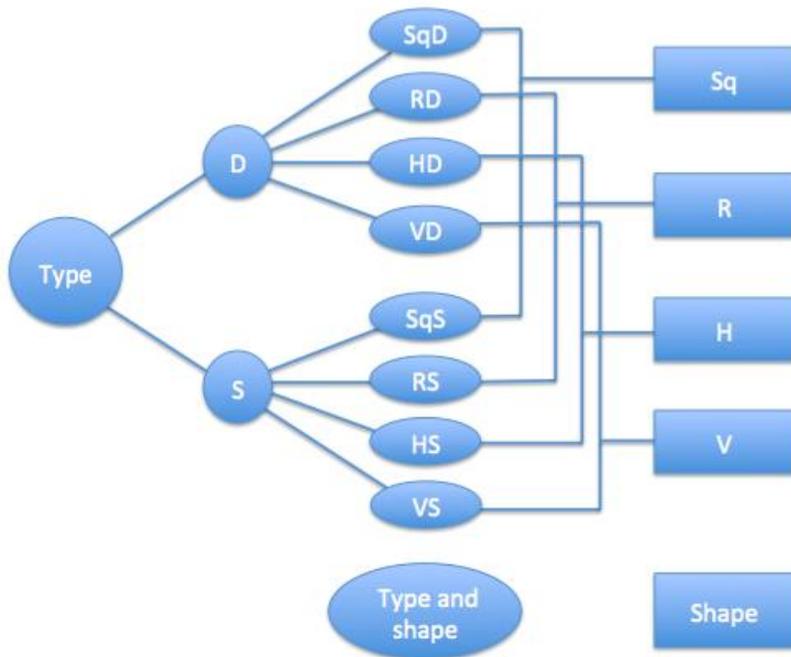


Figure 2. Type and shape comparison model

