Repeat Search Behavior: Implications for Advertisers
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Recent research has found that people who search online before making a purchase tend to search many times before purchasing[1]. For purchasers of keyword ads, this begs the question: what impact does repeat search behavior have on how search marketing performance is evaluated? To gain insight into this issue, we investigated advertiser campaign tracking data and some of the common metrics used in managing online advertising campaigns.

The data analyzed included all tracked search clicks leading to conversion for 10 different advertisers. One month of conversion data was analyzed, and tracked search clicks occurring prior to the one-month window were included in the analysis. Unique users and repeat clicks were identified by means of a tracking cookie. Conversions were tracked by means of a tracking pixel placed on an order confirmation page. The advertisers included in the analysis were all consumer focused, but encompassed a broad range of products and services.

The first question we investigated was: *of purchasers driven by search, what percentage clicked on more than one keyword ad for a given advertiser before purchasing?* The findings are summarized in Table 1 below. Also included in the table are the average number of searches before purchase and the total number of unique keywords leading to purchase. The former includes only paid search click-throughs to the advertiser Web site. The latter has been included because it was presumed that the size of a keyword advertising campaign would have a bearing on the likelihood of repeat search. The correlation coefficient between the two values is 0.154, which indicates that there is little if any correlation, at least in the case of this sample.

From the results of the analysis, we see a few interesting things:

- While the percentage of repeat searches is significant, a majority of purchasers clicked on one keyword ad before purchasing in all cases.

- The number of average searches is high in relation to the percentage of repeat searches, which indicates that when searchers do search more than once, they tend to search many times.

Table 1: Percentage of search visitors who clicked on more than one keyword ad before completing a purchase.

Advertiser	% of Repeats	Average Search Clicks	Unique Keywords
a	13%	2.71	844
b	42%	3.29	2001
c	33%	2.81	113
d	30%	3.27	201
e	41%	3.38	329
f	18%	2.3	138
g	48%	4.09	366
h	36%	2.44	310
i	47%	4.12	145
j	11%	2.22	119
Average	32%	3.06	457

The next question we investigated was: *what impact does repeat search behavior have on conversion attribution?* Typically, a conversion is attributed to the last click before purchase. If a searcher clicked on more than one keyword ad before purchase, then presumably each keyword ad that was clicked influenced the sale and should be considered when calculating performance metrics. For example, a metric that marketers often consider when managing keyword campaigns is the average time from click to conversion, or time-to-convert. In Table 2 below, time-to-convert metrics are compared for the advertisers in our sample. For most of the advertisers, there is a dramatic difference between the two figures. On average, the time from first click to conversion was 2.7 times as long as the time from last click to conversion.

Table 2: Difference in time-to-convert when comparing first-click-to-conversion with last-click-to-conversion.

Advertiser	First (hh:mm:ss)	Last (hh:mm:ss)
a	4:04:57	1:48:22
b	33:56:40	23:25:52
c	24:26:26	11:45:17
d	45:28:34	4:30:20
e	27:13:13	9:58:34
f	23:49:35	20:17:05
g	214:11:43	111:26:17
h	16:37:34	16:22:18
i	69:02:53	29:56:00
j	0:52:17	0:26:06

Another metric marketers often use is cost per order (CPO). CPO is calculated as advertising cost divided by the total number of tracked orders. If considered at the campaign level, CPO does not change when we account for repeat searches, since the total cost does not change[2]. When calculated at the keyword level, however, how we look at keywords changes dramatically. For example, consider the following:

Scenario 1: 100 clicks on keyword X result in 5 orders at a cost per click of $1.

Scenario 2: 100 clicks on keyword X preceded by 25 clicks each on keywords Y and Z result in 5 orders. Keywords X, Y and Z are priced at a cost per click of $1.

In scenario 1, the CPO for keyword X is calculated as (100 x $1)/5, or $20. In scenario 2, we don't have enough information to calculate CPO. First, we have to make a decision about how we attribute click-to-order conversions. Options include: attribute the conversion to the last click only; weight attribution by time delta or another metric; or attribute the conversion equally to all preceding clicks. Since we are looking at the impact of accounting for repeat clicks, we will not consider the first option. Option 2 might make sense, but we do not have enough information to choose a weighting option without further study. Option 3 provides the simplest method of sharing click attribution, and an equally reasonable approach to the last-click attribution method in common use today. Choosing that option, we also need to know which keywords lead to each order, so we can split the conversions accurately.

Applying the shared conversion attribution approach to Scenario 2, we might find that keyword X was the only click before 3 orders and was preceded by Y for one order and preceded by Z for another. The total orders attributed to X using the shared conversion method would therefore be 4: 3 + ½ + ½. The CPO for keyword X in Scenario 2 would then be $25.

To better understand the impact of sharing conversion attribution when calculating CPO, we compared CPO using both methods of calculation for the top 10 keywords in terms of conversion volume for each advertiser in the sample. The results are summarized in Table 3 below.

Table 3: average difference in CPO for the top 10 keyword ads when comparing last-click-to-conversion attribution with shared-click-to-conversion attribution.

Advertiser	Difference
a	1.12%
b	1.84%
c	5.74%
d	4.07%
e	6.95%
f	3.14%
g	3.39%
h	4.28%
i	11.85%
j	1.68%

This can be applied as follows, taking the case of advertiser a: if keyword X has a CPO of $10 when calculated using last click conversion attribution, we can expect a CPO of:

$$\$10 \pm (0.0112 \times \$10) = \$9.89 \text{ or } \$10.11$$

when calculated using shared click conversion attribution.

While the differences here may be relevant to advertisers, they are small in relation to the proportion of repeat clicks. This can be explained by the fact that high volume keywords tend to appear frequently among all searches leading to conversion, whether first, middle or last. In fact, we found that searchers would often search the same keyword more than once before converting. Analyzing repeat search behavior for the advertisers sampled, 82% of converting visitors who searched more than once before completing an order searched the same keyword multiple times. Note that the visitor may have also searched more than one unique keyword, but their searches included the same keyword at least twice.

Having looked at only the tracked clicks for a small set of advertisers, it is important to note that we don't know what we don't know. There could be a universe of keywords available to the advertisers in this sample that would lead to a higher incidence of repeat search and there are many factors that were left out, such as keyword rank and product depth. Based on what we *do* know, a significant percentage of visitors click on more than one keyword ad before completing a purchase, and their behavior, when taken into account, has a meaningful impact on the metrics marketers use to manage search advertising campaigns.

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[1] Press Release, comScore Networks, Inc. (Dec. 13, 2004). comScore Study Reveals the Impact of Search Engine Usage on Consumer Buying. Retrieved September 26th, 2005, from http://www.comscore.com/press/release.asp?press=526
[2] Unless we also factor in repeat searches coming from more than one campaign.