



DIGITAL SEARCH ADVERTISING – THE ROLE OF POST-CLICK FACTORS IN GENERATING PURCHASE CONVERSIONS

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ABSTRACT

A lot of research is available on the effectiveness of search as an advertising channel. Most of these studies tend to treat a click on a search ad as a binary event. All of them study the events leading to the click. This paper goes beyond this to study the post click actions taken by a user subsequent to clicking on a search ad, and refers to those actions as depth of interaction, and testing the variables that have an effect on the final outcome. We use a prescriptive research design employing binary logistic regression analysis. Results indicate that the duration of time spent, device used, and recency of visit have a very high positive effect on the final outcome.

KEYWORDS : search advertising, depth of interaction, conversion funnel, sales conversion, post click, AIDA, logistic regression

INTRODUCTION

Search engine advertising is a "type of digital advertising in which advertisers buy ad positions for specific keywords from a search engine company, which then displays those ads alongside organic search results" (Park & Agarwal, 2018). As a result of its rapid growth, "paid search advertising has become the financial backbone of search engine companies such as Google, Yahoo!, and Bing" (Domachowski, Griesbaum, & Heuwing, 2016).

Advertising on search engines is triggered when the user enters the keywords/phrases in the search engine. "Sponsored products appear in the top positions of a set of search results or amid organic listings, where they include a sponsored identifier" (Sharma & Abhishek, 2017). The largest revenue source for search engines is sponsored search and it is also the main form of online advertising for lead generation and sales for advertisers (Chen, Liu, & Whinston, 2009).

Search ads' effect on conversion (i.e., purchases) was studied by Chalil, Wahana & Bauman (2020) and according to them, conversion probability in search ads increase significantly, by as much as 65.26% on average compared to other channels. Consumers, when exposed to a search ad, can take any one of the two action – ignore the ad or click on the ad. Every visit to the advertisers' website, allows the consumer to gain more knowledge about the product, thus pushing the consumer further along a path of purchase as they go from *aware* state to *interested* state to *desire* state before eventually taking the action.

All these post-click interactions result in variables of time & frequency, which together, can be referred to as "depth of interaction". One can argue that if the interaction is deeper, it is more likely that they are moving along the AIDA funnel and eventually going to convert by taking the desired action.

Enough empirical studies have been done to understand the effect of pre-click factors in search ads which lead to a spike in the effectiveness i.e., impression by Chan & Park, 2015, CTR by Goldman & Rao, 2016, and conversion rate by Rutz, Bucklin, & Sonnier, 2012. The authors of this paper are of the view that events that take place after the click have a direct impact on the chances of the consumer converting to buy the advertiser's product.

The aim of this paper, therefore, is to investigate the effect the post-click behaviour on the final conversion and, therefore, what can advertisers do to increase their chances of conversion.

2. Review Of Literature

Search engine marketing is a type of marketing over the internet using popular search engines. The main aim here is to promote the brand by increasing the visibility of the website. A Search Engine primarily has 2 ways in which it can help in promoting the brand's website viz. Search Engine Optimisation (SEO) which is organic and paid advertising on search engine also known as paid search.

It would be pertinent to point out here that "unlike pay-per-click advertising, SEO has no cost other than the time required to implement it" (Buxton & Walton, 2014, p. 90). The only way to achieve higher rankings in search rankings is by implementing what are known as SEO techniques. Unfortunately, most companies time and the patience to implement such a program and wait for results. They would rather pay up so that it "can ensure a website being listed immediately and, furthermore, can ensure high rankings, assuming a high bid price and quality score" (Kritzinger & Weideman, 2013, p. 274).

The paid search results are displayed based on an auction in which advertisers participate and they pay only when a user clicks on the ad. In other words, a search engine earns revenue only when users click on the ads (Faulds et al., 2018). The theory of "Stimulus-Organism-Response (S-O-R)" as put forward by Mehrabian and Russell (1974) will form the basis for this paper. This model is appropriate for studies that aim to understand the different aspects of consumer behavior (Rodriguez-Torrice et al., 2019). There is extensive application of the S-O-R theory in research that study the "effect of online stimulus on consumer behavior" according to Loureiro & Ribeiro, 2014. According to the S-O-R theory, when consumers are exposed to certain stimulus (S), they respond with a "cognitive and affective reaction (organism-O)", which results in a positive behavioral response ®.

Users flow through the search process from typing a search term in google to clicking on an ad to buying a product on advertiser's website.

AIDA model

This user flow can be understood using the AIDA model first introduced by Elias St. Elmo Lewis in 1898 and later mentioned in the marketing and advertising literature by Lewis (1903) and Strong (1925), according to whom the stages, "Attention, Interest, Desire, and Action, form a hierarchy that is linear in nature. To be motivated to make the purchase, a customer must move from being aware of a product's existence to be interested enough to pay attention to its benefits, to having the desire to reap benefit from the product". The final stage, "Action" would occur as a natural

result of the customer's movement through the preceding three stages.

Given that most consumers don't buy from an advertisers' website in their first visit, multiple visits lead to the consumer gathering more and more information in each visit leading the consumer to move through the stages of the AIDA model eventually leading to a sale (conversion).

Post-click factors and Depth of interaction.

The following diagram illustrates the search process that a user undertakes on a search engine:

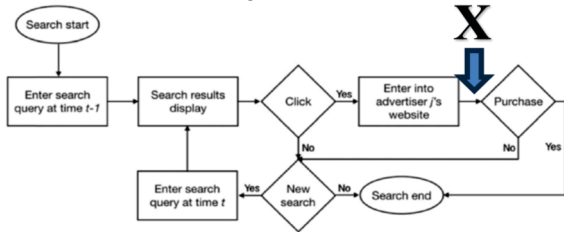


Figure 1: Flowchart of Customer Search Loop.

A lot happens at X i.e., between clicking on the advertisers' search ad on a search engine and the said consumer taking an action on the advertisers' website that will count as conversion. Among the actions that a consumer may take at X are:

1. time spent in a single session,
2. no. of pages visited in a session,
3. depth of pages (as laid out) surfed,
4. no. of such sessions within the campaign
5. recency of visit compared to earlier visit
6. Device used to click on the search ad.

Extant research on the topic have investigated the effect of ad exposure and click on the conversion. But there are no studies investigating the effect of *depth of interaction* on conversion. The authors of this paper, therefore, are attempting to answer a simple question – if a click leads to a higher *depth of interaction*, would it lead to a higher probability of conversion?

A review of existing literature and the above discussion have led the authors to identify the following research gap.

3. Research Gap

While the effect of events, leading to the click, on the final outcome (purchase/conversion) has been studied in extant research, there are no studies measuring the effect of post-click factors (*depth of interaction*) on the final outcome.

4. Research Objective & Hypothesis

The authors of this study intend to study the effect of the various elements that make up the *depth of interaction*.

The following hypothesis, therefore, are proposed:

- H1 = conversion is correlated positively to *average duration (time spent)*.
- H2 = conversion is correlated positively to *average no. of pages browsed*.
- H3 = conversion is correlated positively to *average depth of pages browsed*.
- H4 = conversion has a positive correlation to *recency of visit to the website*.
- H5 = conversion is correlated positively to the *device used during website last visit*.

5. Research Methodology

Data & Sampling

A prescriptive research design was used to study how consumers responded rather than how they would respond

when exposed to the stimuli (search ads). The data for this study is from a search campaign run by a credit card company, to get consumers to click on an ad, direct them to the company website, where they fill a form with their contact details, allowing the company to get in touch with them to complete the further documentation. For the purpose of this paper, therefore, the act of filling and submitting the online form successfully, is considered a sale/conversion.

For the purpose of data collection, a 31-day period between Jan & Feb 2022 (specifically 17th Jan 2022 to 16th Feb 2022), was considered, during which period, all the ads were run by the company.

Sample selection: 8,281 unique consumers were targeted by the search ad campaign during the said time period. Out of this set, those who were exposed to one or more search ad, was 1,947. In order to select purely random sample, www.randomiser.org was used to random numbers. This selection did not take into account the final outcome, hence, both set of consumers who converted as well as those that did not converted were considered.

Sample size: According to Slovin's formula (Chakraborty & Bhat, 2018), a reliable sample size for this study is anything above 100. The authors of this paper, chose to use a sample size of 200 consumers and their exposure to search ads during the campaign period, was taken into consideration.

Analysis: Since a logit model results in outcomes whose probability lies between 0 and 1, we need to use a cutoff value to determine the outcome as a binary event. A probability value of less than 0.5 is to be classified as 0 whereas a value greater than 0.5 gets classified as 1. The logistic function or the logit function, is represented below:

$$Logit (y) = \frac{1}{1 + \exp(-y)}$$

where $y = \beta_0 + \beta_1 * x_1 + \dots + \beta_n * x_p$

6. Data Analysis & Interpretation

Table 1: Frequency of the dependent variable

Page Event	Frequency	Percent	Valid Percent	Cumulative Percent
No Purchase	92	57.1	57.1	57.1
Purchase	69	42.9	42.9	100.0
Total	161	100.0	100.0	

Table 1 above displays the frequency of the target variable where 92 visitors out of 161 did not purchase (57%), while 43% of the visitors i.e., 69 out of 161 purchased.

Table 2: Classification table generated by the prediction model

Classification Table generated by the prediction model				
Observed		Predicted		
		No Purchase	Purchase	% Correct
Page Event	No Purchase	78	14	84.8
	Purchase	33	36	52.2
Overall Percentage			70.2	

α. The cut value is 0.500

The table 2 above illustrates the classification of outcomes delivered by the binary logistic regression. The hit ratio is 70.2% which means the model predicts 70 % of the original group correctly.

Table 3: Table of the model variables with coefficients, p-value and Exp. (B)

Variables in the Equation						
	B	S.E.	Wald	df	Sig.	Exp(B)
Search	0.552	0.228	5.877	1	0.015	1.737

Dur_Search	0.002	0.001	5.777	1	0.016	1.002
Pages_Search	0.047	0.119	0.155	1	0.694	1.048
Depth_Search	-0.119	0.125	0.903	1	0.342	0.888
Recent_Search	-0.136	0.062	4.792	1	0.029	0.873
Device_LastVisit	0.884	0.353	6.260	1	0.012	2.421
Constant	-1.544	0.809	3.645	1	0.056	0.213

α. Variable(s) entered on step 1: Search, Dur_Search, Pages_Search, Depth_Search, Recent_Search, Device_LastVisit.

The above table 3 exhibits the regression coefficients, where Search, Duration of the Search, recency of visit, and the device last used all turn out to be significant variables in predicting the correct group since the significance value of these coefficients are less than 0.05. Number of pages and depth of pages seemingly don't have a significant role in predicting the target group. The Cox and Snell R² is 0.140 and Nagelkerke R² is 0.188 which is fairly good and significant compared to the base model which is without any predictors.

The Exp. (B) value illustrates that except Depth of Pages and recency of search, all the other variables are positively correlated as their value is more than 1. The Wald statistics, which denotes the importance of the variables, points that the important variables are Device used for last visit (6.316), followed by depth of pages visited (1.823) and then by number of times clicked a Search (1.347), recent visit was Search (1.192) and finally duration of Search(1.003).

The Final Logistic Regression Model Can Be Written As:

$$Y = -1.54 + 0.55 * Search + 0.002 * Duration\ of\ Search + 0.05 * Pages\ Search - 0.12 * Depth\ Search - 0.14 * Recent\ Search + 0.88 * Device\ Last\ visit.$$

7. DISCUSSION & CONCLUSION

In this paper, we have built a mathematical model to predict the likelihood of consumers converting at the end of a series of ad exposures across various digital media channels, in which at least one of them is a search ad. The following variables, out of the variables that constitute *depth of interaction*, have acceptable significance value (sig<0.05) in predicting the target variable:

- Duration of visit = 0.016 < 0.05
- Recency of Display = 0.029 < 0.05
- Device last used = 0.012 < 0.05
- Accordingly, we accept the hypothesis H1, H4 & H5.
- The other findings show that the following have significance value outside acceptable limit (sig>0.05):
- Depth of Pages = 0.694 (sig>0.05)
- No. of Pages = 0.198 (sig>0.05)
- Accordingly, we reject the hypotheses H2 & H3.

The significance of this paper is in discovering the importance of the post-click events which lead to a conversion. An understanding of these factors can help the managers to rejig their advertising budget to focus on those factors that contribute to the conversion.

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