

Finding the Right Words: The Influence of Keyword Characteristics on Performance of Paid Search Campaigns

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Abstract

Despite its importance for both e-commerce and traditional offline vendors, managing paid search campaigns is often based on trial and error. In particular, neither research nor practice has extensively addressed identifying relevant keywords and setting appropriate matching options. The authors develop a model based on a keyword's intrinsic and extrinsic information content to shed light on how keyword characteristics affect campaign performance. Intrinsic information includes linguistic aspects and user- and content-related features, which can be indirectly changed through extrinsic information such as matching options. Using an advertiser-level data set from multiple industries, this study evaluates the impact of these criteria on click-through and conversion rates. The authors find that the query variation index, which measures whether a keyword contains sufficient information to identify a user's information need correctly, is an effective predictor of keyword performance. Moreover, they show that the relationship between two of the main predictors, namely, query variation and advertiser names, and a keyword's performance is moderated by the advertiser's choice of matching options.

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Introduction

The Internet has fundamentally changed how consumers acquire information and perform transactions (Darley, Blankson, and Luethge 2010; Hennig-Thurau et al. 2010). Search engines (e.g., Bing, Google, and Yahoo!) in particular play a vital role in connecting users with sellers, as they enable advertisers to display targeted advertising messages next to the “organic” search results from the search engine (paid search advertising). To display their ads in search engines, advertisers must place bids on keywords. When a keyword appears in a user's search query, an ad – a short textual message created by the advertiser – is displayed on the

top or right-hand side of the organic search results. If several competitors bid on the same keyword, the display position and the actual cost per click are determined through an auction (Katona and Sarvary 2010). Paid search can be favorable from an advertiser's perspective because it can send precise advertising messages to consumers when they are looking for specific information (Hillard et al. 2010). The development of online advertising budgets seems to support this: paid search is the largest online marketing instrument. In the United States, it constituted 43% of the total online marketing expenditures in 2013, amounting to US\$18.4 billion (PriceWaterhouseCoopers 2014). It is not surprising that paid search has become an important source of traffic for Web sites and online shops (Yao and Mela 2011).

However, managing paid search campaigns is not a trivial task. It comprises multiple activities that must be executed continually: (1) selecting relevant keywords, (2) defining and adjusting the bids on a keyword level, and (3) creating the ad copy (Rutz, Bucklin, and Sonnier 2012). With regard to bids

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and pricing, several studies have focused on optimal bidding strategies (Feldman et al. 2007; Goldfarb and Tucker 2011; Skiera and Abou Nabout 2013) and the design of paid search auction mechanisms (e.g., Edelman, Ostrovsky, and Schwarz 2007; Varian 2007; Xu, Chen, and Whinston 2011; Zhu and Wilbur 2011). In practice, advertisers (or their agencies) often use specialized tools to professionally manage keyword bids (e.g., EfficientFrontier, IntelliAd, and Omniture). There also is substantial research on ad copy. Several studies have analyzed the influence of content and position of advertising texts on campaign performance (e.g., Agarwal, Hosanagar, and Smith 2011; Animesh, Viswanathan, and Agarwal 2011; Jansen and Resnick 2006; Jerath et al. 2011). However, significantly less knowledge is available with regard to the first task of selecting the right keywords. Although some empirical studies have incorporated keyword characteristics as covariates (e.g., Abou Nabout and Skiera 2012; Ghose and Yang 2009; Rutz and Bucklin 2011; Rutz and Trusov 2011; Yang and Ghose 2010), neither theory nor practice exhibits full understanding of the underlying drivers of keyword performance.

Selecting the right keywords is crucial for successful paid search campaign management, as keywords represent the link between user queries and advertiser messages. For example, if an advertiser selects a keyword that is too generic to resolve a user's informational need correctly, the likelihood that the presented ad will be relevant for the user decreases, eventually resulting in a lower response to the ad (Gupta, Bilenko, and Richardson 2009). To address this issue, we investigate the following research question: *What criteria can be used to select keywords and predict keyword performance?*

Because it can be challenging for advertisers to generate an exhaustive list of all relevant keywords for a campaign, search engines offer matching options (Bartz, Murthi, and Sebastian 2006; Gupta, Bilenko, and Richardson 2009). When advertisers use *broad* or *phrase* matching, the keyword must only be related to the search query – and not match it exactly – to trigger an ad impression.¹ These generic matching options can help advertisers increase the reach of their paid search campaigns substantially and are often used in practice: according to Google (2013b), broad match is the default matching option. Because matching options drastically alter the matching logic, they can have a considerable impact on the perceived relevance of the search results for the user and thus the keyword performance. However, thus far, it is not clear when (i.e. for which keywords) broad and phrase matches are more advantageous and should be preferred over *exact* match. We address this issue, which is of high managerial relevance as prices generally differ between matching options, in our second research question: *Which matching options should advertisers choose depending on keyword characteristics?*

In this study, we provide insights into these two questions by analyzing the impact of keyword characteristics on the effectiveness of paid search campaigns (measured as keyword-specific click-through rate [CTR] and conversion rate [CR]). Because all our criteria are related in some manner to the information a keyword carries, we summarize them under the concept of “information content.” In doing so, we distinguish criteria related to intrinsic information content (defined by the keyword text itself) and that related to extrinsic information content (induced through the external choice of matching options). Following an interdisciplinary approach, we derive the intrinsic keyword criteria from research in linguistics (Krovetz and Croft 1992; Luhn 1958), information retrieval [IR] (Rijsbergen 1979), and online marketing (Ghose and Yang 2009; Jansen, Sobel, and Zhang 2011; Rutz and Bucklin 2007). To estimate the influence of these characteristics on campaign performance, we present a model and test it on a German data set representing several paid search campaigns. To address the second research question, our unique data set allows us to model the influence of matching options on this relationship.

We find that campaign performance is strongly determined by two intrinsic keyword characteristics. The most influential factor is a newly introduced metric called “query variation index,” which we develop from previous IR research in search log analysis and user search modeling. Keywords containing an advertiser's name are confirmed as good predictors of campaign performance. We also find that matching options moderate the influence of these predictors. In addition, our findings confirm selected characteristics that have been identified as predictors of keyword performance in prior research. Our results can help advertisers manage paid search campaigns more professionally, by enabling them to better identify relevant keywords, select the appropriate matching options, and evaluate their individual performance—all core tasks in paid search campaign management.

We organize the remainder of this paper as follows. The next sections present the underlying theoretical framework of our study and develop hypotheses on the relationship between a keyword's intrinsic and extrinsic information content and its performance. Then, we present the real-life data set we use in our study and develop the empirical model. In the **Results** section, we first analyze the influence of a keyword's intrinsic information content on its performance; then, we add keyword matching options to the analysis (extrinsic information content) and investigate interaction effects. We continue with a discussion of the findings and shed light on implications before concluding the paper with suggestions for further research.

Theory

To explain and model the influence of keyword features on performance in paid search campaigns, we base our research on insights from prior work on advertising effectiveness theory and concepts from information retrieval research (see Fig. 1). Cho and Cheon (2004) investigate advertising effectiveness for online marketing campaigns in the context of banner advertising. Building on prior work by Vakratsas and Ambler (1999) and Speck and Elliott (1997), they find that the better a user's

¹ Phrase match allows the user query to have additional terms (as long as the keyword terms are included in the query), and broad match, the least restrictive option, also identifies a match if a query has fewer terms than a keyword or the keyword is not included at all (e.g., if the user enters a synonym; Google 2013b; Gupta, Bilenko, and Richardson 2009).

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