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# A Framework to Generate Optimal Keyword List for Pay-Per Click Advertising in an Organization

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## ABSTRACT

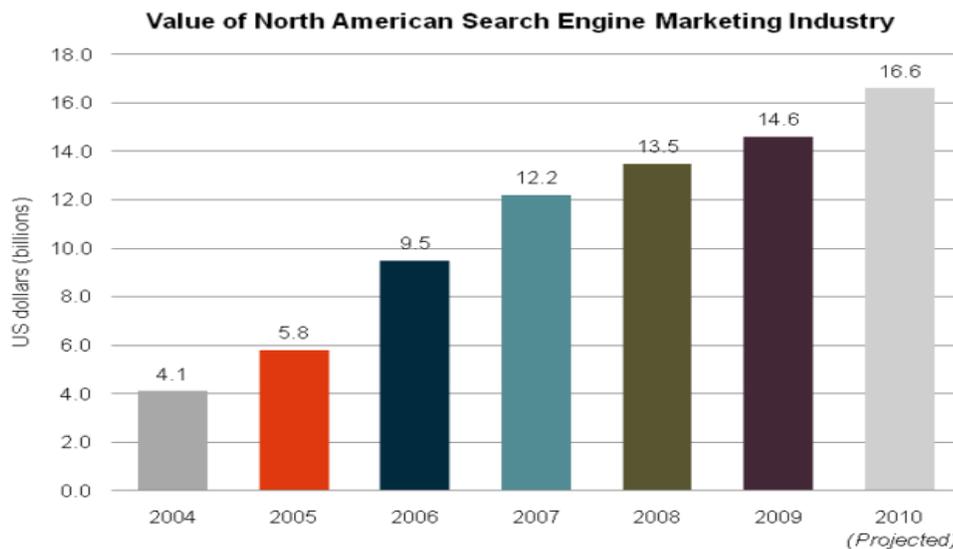
Web advertising is playing a key role making huge turnovers in terms of revenue for the advertisers. Internet became a primary source of valuable information for everyone. The search engines are playing an important role as information providers over a decade. Online Advertising and Search Engine Optimization (SEO) became two primary sources for advertisers to implant their information online and keywords play an active role in driving traffic to the retailer's web site. It has always been a challenge for the advertisers to identify an ideal strategy for gathering keywords that would yield impressive results. This research article is an effort to provide an ideal framework that can be adopted by an advertiser to generate optimal list of keywords that can drive good quality traffic to the web site. The author refers an 'optimal list' to state the quality of keyword list that can be generated using the proposed framework.

## Keywords (Required)

Search Engine Optimization, Search Engine Marketing, Online Marketing, Advertising

## INTRODUCTION

Internet became the primary source of information in the 21<sup>st</sup> century. Search engines are playing an important role in providing reliable information (Cofta, 2008; Davis et al. 2010; SEMPO, 2010). Electronic marketing has revolutionized the conventional marketing industry and became a primary source for the marketers to reach numerous people across the globe. Interesting results were observed in the 2010 annual survey reports of SEMPO [Search Engine Marketing Professional Organization]. Figure 1 (SEMPO, 2010) clearly explains the ever-growing market of advertising industry in North America. The Search engine marketing revenue is projected from 14.6 in the year 2009 to 16.6 billion U.S. dollars for the year 2010.



**Figure 1: Projected search engine marketing industry revenue report (SEMPO, 2010)**

This clearly explains the influence of electronic marketing on conventional marketing methods. The search engines primarily work using crawling, indexing and ranking algorithms (Introna & Nissenbaum, 2000). The search results yield a huge list of web pages which are sorted out and placed based on the keyword relevance and page rankings assigned to them by the search engines (Ash, 2008). It is always a challenge for the developers to develop good quality web pages that can withstand the competition, rank first and get placed among the first few pages of the search results (Huang, 2003). The search engine

identifies the highest bid keyword with good page rank and places it on the first page results. A well structured web page isn't enough to with stand the competition; it needs a good set of relevant and reliable keywords which are capable of driving quality traffic to the advertiser's web pages.

## 2. MOTIVATION

The author has been working as a SEO analyst from the year 2010 moderating Google Ad-words, Google Analytics and other SEO for Dakota State University in Midwest. Recent advancements in the areas of marketing and e-commerce industry have led to new challenges (Khan et al. 2009; Devanur et al. 2009; Joshi et al. 2006; Lee et al. 2009; Rosso et al. 2010; Yu et al. 2007). Growing demand and huge competition rivalry has increased the advertiser's quest for quality efficient, relevant keywords. Devanur et al. (2009) provided an online keyword matching algorithm using random permutations, Joshi et al. (2006) presented Terms Net, an approach to generate non-obvious yet relevant keywords. Although the literature provides mathematically proven algorithmic models, it is evident from the literature that there is a great need for efficient and effective methodology which is capable enough to generate an optimal keyword list. This research is an effort to fulfill such necessity. A brief description of the basic terminology followed in advertising is provided in Table 1.

TERMINOLOGY	DEFINITION
Conversion	The actions made by the visitor on the web site those benefits the advertiser.
Impression	Every time an ad appears on a search result is counted as an impression.
Click	It occurs when a user clicks the ad leading him/her to the web site is a click.
Lead	A visit to a page that enters the conversion cycle and potentially lead to conversion.

**Table 1 Basic Terminology used in SEM** (Grappone et al. 2006; Introna et al. 2000; Jones, 2008; Moran et al. 2009)

## 3. PROBLEM DESCRIPTION

Though we have ample literature available on electronic marketing, search engine optimization explaining algorithms, mathematical models like Terms Net (Devanur et al. 2009), navigational architectures and analyzing user web searching behavior (Granka et al. 2004), there is enough evidence that no research clearly suggest a particular strategy that an advertiser might follow to identify keywords that are ideal and capable to draw traffic to the retailers webpage. The author proposed a cyclic framework using the literature (Ghose et al. 2009; Ghose, 2008; Ghose et al. 2008) explaining several steps an advertiser might need to follow in order to identify keywords that can be efficient enough to drive good quality traffic.

## 4. LITERATURE REVIEW

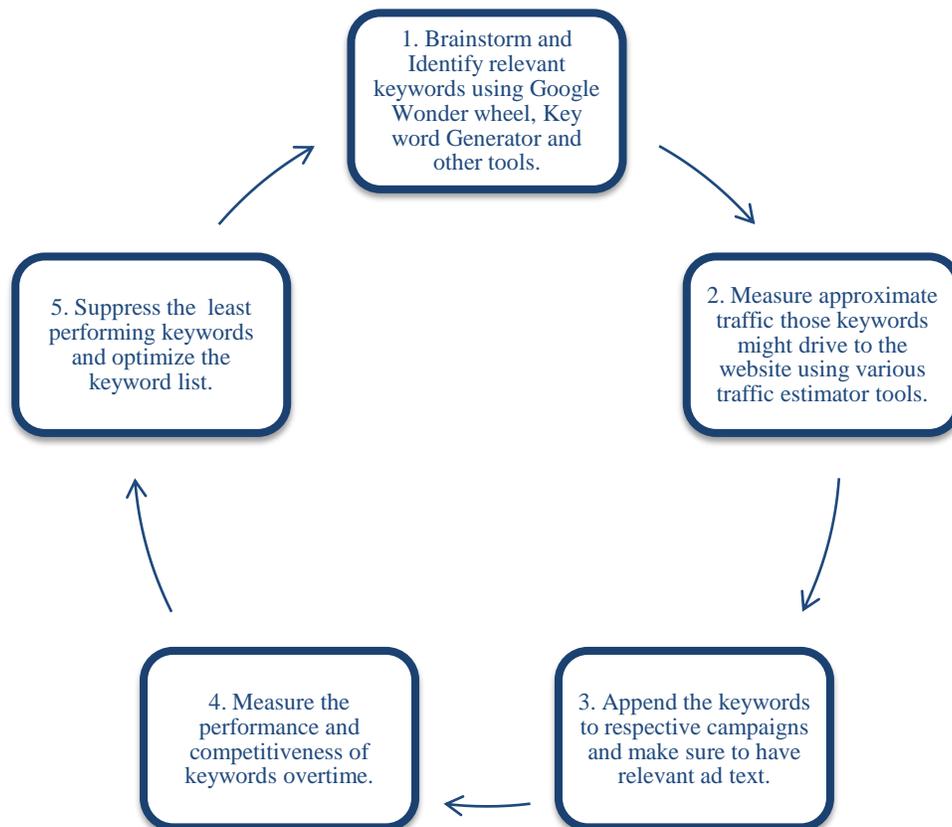
Popular search engines like Google, Yahoo and Bing are acting as possible interfaces between the users and marketers ( Yu et al. 2007) and this is how it works with search engines; a web site with multiple pages containing information about an industry, educational institution, sales company is developed with a site map that helps the knowbots and crawlers to easily navigate through the web site (Ash, 2008; Grappone et al. 2006; Wuebben, 2008). Good set of relevant keywords are used throughout the text embedded in the web pages by the developers. User clicks a particular ad, it redirects the user to a web page which is formally denoted as a landing page. The landing page should be structured in an attractive way and channel the visitors to generate conversions (Ash, 2008; Wuebben, 2008). Search engines act as a primary source for driving traffic to those web sites (Wuebben, 2008). Search engines provide thousands of results for every keyword and it is observed that users are less likely to browse beyond first few pages which apparently implies that search engine positioning is highly important for the web sites to survive in the market (Clifton, 2008; Jones, 2008; Moran et al. 2009; Wuebben, 2008; Yu et al. 2007).

Yu et al. (2007) gave an overview about the working mechanisms of organic search or non-paid search engine marketing management system and paid search engine marketing management system. Organic search results for a web site can be increased by optimizing the web pages, site structure, use of good quality keywords throughout the text written on the pages. Paid marketing management strategies follow pay per click methodology where the advertiser pays for the number of ad-clicks (Wang et al. 2009). Search engines like Google provide interactive interfaces like Ad-words and Analytics etc through which the advertisers place text ads, video ads, ads on social networking sites like Facebook and Twitter to attract traffic to their respective web sites. Search engine marketing systems are really tricky, driving traffic to the web sites doesn't solve the actual problem, the directed traffic should be able to generate a conversion else the advertiser would result in paying huge money with no return on investments (Ghose, 2008; Xing & Lin, 2006; W. D. Yu & Lin, 2007).

Different advertisers have different motives in approaching search engine marketing. There are some advertisers selling products or services online through their web sites, some depend on leads, some want to drive traffic to their web site, some want to increase brand awareness and enhance reputation and some are trying to improve customer service and aim at customer satisfaction. Jansen et al. (2007) isolated the effect of branding variables while controlling the number of search results. Ghose, (2008b) used a hierarchical bayesian modeling framework and estimated the outcomes of search results using the Markov Chain Montecarlo Modeling method to empirically estimate the impacts of keywords on user searches. Ghose et al. (2009) developed a framework to empirically analyze the electronic market tendency towards the sponsored search results in accordance with the pay per click marketing. Wang et al. (2009) conducted a competitive analysis to explore the keyword based competition between the advertisers. Khan et al. (2009) proposed a unique strategy to collocate different keywords with their respective ads which ultimately enhanced the performance of pay-per click advertising. All the existing literature precisely concentrated on articulating either computational costs with matching algorithms or by several frameworks that are mathematically proven decision making models to provide expected values on click-throughs and cost per conversions. Very few studies like (Ghose, 2008a; Ghose & Yang, 2008, 2009) made discussions on importance of keywords in paid placement marketing. The following sections discuss the research question and underlying theoretical factors that are considered to formulate the framework that is expected to provide a meaningful solution.

## 5. PROPOSED FRAMEWORK

The proposed framework consists of five important steps involved that will finally generate a list of reliable keywords. Online marketing is highly competitive and ever growing field. Every advertiser tries to compete and promote his/her web pages to get placed on the first page of the search results. Developing a cyclic framework enables the user to generate well refined and good set of keywords that can be compared and blacklisted based on their performance over time. Figure 2 clearly describes the cyclic framework. The advertiser might need to have a good knowledge about the online advertising strategies in order to apply this framework.



**Figure 2: Cyclic Framework to generate a list of optimal Keywords**

**Brainstroming:** Generate a list of relevant keywords using tools like Google’s wonderwheel, keyword generator. User often get confused from a huge list of keywords that are shown as relevant by the keyword generating tools.

**Estimating the traffic:** To have a clear idea on the keyword performance and estimating the traffic one can use traffic estimator tools provided by google and other third party services which will give an estimate of the amount of traffic the keyword can drive to the web site.

**Append the keywords:** The advertiser might need to carefully write appropriate text for the ad to get displayed when a particular keyword is searched. Relevance between the ad text and keywords plays an important role in driving traffic. The advertiser appends most relevant keywords to the text ads placed on the paid campaigns.

**Measuring the performance:** The keywords compete with one another over time, so the advertiser might need to measure the keyword performance and competitiveness over time based on the number of impressions and clicks the keyword has drawn to the webpage.

**Blacklisting:** Sort out the best performing keywords and suppress the least performing keywords by blacklisting them using competitive analysis (Wang et al. 2009). This process can help the advertiser not to use the same keyword again in the future. The click through rates and impression numbers are compared with one another using the Markov chains competitive analysis procedure (Norris, 1998)

## 6. EVALUATION

The click through rate, number of conversions obtained in a specific time line, rankings of the keywords, number of impressions are the underlying metrics that are expected to use in the evaluation process. Each keyword is typically evaluated following a competitive analysis procedure. Mutual competitiveness is analyzed based on the number of impressions versus the number of clicks and total conversions each keyword received. Best performing keywords are identified and the least performing keywords are blacklisted and documented. The proposed framework expected to yield optimal results for the advertisers.

## 7. CONCLUSION

This research explains how the conventional marketing tend towards online marketing stream with the advancement of technology over the years, followed by an explanation of the flow of process in the online marketing field with a brief view on the existing literature and later on addressing the research question in designing a framework that clearly depicts the proposed strategy an advertiser might follow to generate an optimal list of keywords that helps in driving good quality and reliable traffic to the web pages. This research has several limitations. The keyword tools suggested in literature generates a huge list of results that leaves a scope in working with large data sets. The authors choice in choosing a cyclic framework makes it a repetitive process which eases the entire process. Competitive analysis acts as a stance to extract well refined keywords that can be optimal for an ideal situation yielding impressive results.

## 8. ACKNOWLEDGMENTS

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