The value of search engine ranking

Master Thesis

The effect of search engine ranking on a web site's added value

Ruud Kok (info@ruudkok.nl)
Student number: 9910026

June 7, 2008

Master Thesis / Business Administration
School of Management and Governance
University of Twente

Coach: Dr. E. Constantinides
Co-reader: Dr. Ir. A.A.M. Spil

Management summary

Search engines such as Google are the main way for internet users to find web sites. This means it is crucial for any web site to appear in the search results of those search engines in order to attract web site visitors from it. Since search engine users are more likely to click on a result at the top of the result page, being present only is not the optimal situation. A high search engine ranking is important for attracting traffic from search engines.

This research focuses on the impact of a high search engine ranking on the amount of visitors from the search engine and what value comes with these visitors. Therefore the methods for increasing search engine traffic are reviewed in the first part of this paper. Based on this information the theoretical framework is constructed and three propositions are drawn up. The second part of this research consists of a multiple case study in which these propositions were tested. During the test period the search engine ranking for the two test cases (1), the amount of visitors from search engines (2) and the sales figures (3) were measured on a weekly basis. The results were then used to validate the developed research propositions.

Search engine marketing (SEM) can be applied to increase search engine visibility of a web site. When the search engine visibility is increasing the chance that a web site is visited increases as well, hence search engine marketing increases web site traffic. There are two clearly distinctive types of search engine marketing. Firstly there is search engine optimization (SEO) which improves volume and quality of web site visitors through the natural search results, also called organic listings. The advantage of SEO is that the visitors from organic search are free of charge, however it can require a time consuming process to gain and preserve a top search engine ranking. The second type of SEM is search engine advertising (SEA) which is based on actually paying for advertisements next to the organic search results. This method has the benefits of speed and flexibility as a campaign can be set up almost instantly. Contrary to search engine optimization however, every visitor from search engine advertising has to be paid for.

During this research SEO practices have contributed to an increase in search engine rankings for both test cases, this in turn resulted in a significant increase in traffic from the search engines. In order for search engine marketing to be profitable the additional traffic should also result in increasing value for the web site. It is widely argued that higher search engine ranking attract more targeted traffic, as these visitors are actively searching for a product or service. However it must also be noted that an increase in search engine ranking leads to an increase in less relevant traffic as well. This could be explained by the fact that more accidental or explorative visitors will find and visit the web site. This has the consequence that even though the amount of visitors from search engines rises, the individual visitor on average seems to be of a lesser value. This in turn dampens the increase of the total amount of added value.

Nonetheless this research has shown that even though the decreasing value per visitor dampens the growth of the total added value, the increase in web site traffic that is accompanied with increasing search engine rankings does overtake the dampening. On the intervals that were measured in this research an increase in search engine ranking resulted in relatively more increase in traffic than decrease in value per visitor. For instance an increase from the fifth to the fourth place in Google for a specific keyword resulted in a 10 percent decrease in value per visitor against a 50 percent increase in traffic. Hence increasing search engine visibility has a positive effect on both the amount of visitors from search engines as well as the total value of these visitors.

Table of contents

Preface

There is much written about search engine marketing in practice but in academic papers there seems to be little interest for this aspect of online marketing. As the influence of search engines like Google in the online environment increase, it becomes increasingly relevant to gather more information around this subject. Therefore I would like to make a start in writing about this quite exciting topic.

Since my introduction to this topic in 2005 I have been fascinated by the importance of decent search engine visibility. The practice of optimizing web sites for enhanced rankings and actually increasing traffic from search engines as a result of these increased search engine rankings are very inspiring. Therefore I am very pleased with the possibility that was given to me by both M4N and the university to graduate in this field of my personal interest. Nonetheless I was completely astonished by the fact that so little academic literature was written about this increasingly important topic. There are many people writing about search engine marketing, but most of this information is written by practitioners and is only available through online communities and weblogs. At first the fact that my research topic was quite practical seemed very exciting to me. However this initial excitement at times led to some doubts on how to give this subject some academic body. Fortunately these doubts were quickly washed away when exciting research results came in and set up propositions were to be tested.

This thesis is the result of explorative research on the effects of search engine rankings on a web site's added value. Two customers of affiliate broker M4N took part in this multi-case study whom I want to thank for their support. Although many different people have supported me during the entire process of designing, executing and reporting my research, there are three people I would like to thank right here. First I would like to thank my two attendants at the university Efthymios Constantinides and Ton Spil for their support in creating this scientific paper. Second, I would like to thank Edwin Metselaar, my superior at M4N for making it possible to perform the research while taking part in everyday work at this fast growing organization. It has been a great experience.

Ruud Kok
Amsterdam, June 2008

1. Introduction

1.1 Introduction and background

When searching for something on the internet, one is likely to use a search engine like Google or Yahoo to find what one is looking for. After typing in the search terms that seem relevant, a certain set of results is presented by the search engine. Regardless of the methods which underlie the order in which the results are displayed one is likely to start viewing the results in the upper left corner of the computer screen first. Thereby one is almost blindly relying on the search engine's competence to define what results are relevant for the specific search query. This human attitude implies that any web site which is displayed at the top of the search engine results is more likely to be clicked on than those below it (Gisbergen 2006). This means that a high ranking web site will have more visitors from search engines than a web site which has a lower ranking on the search engine result pages. This immediately indicates the importance of high search engine ranking for any web site owner in order to gain traffic from these sources.

A search engine basically is a web site that uses automated robots to index web pages. Users can search the index by typing in the keywords and then the search engine's algorithm determines which pages will be listed within the results (Chaffey 2006). The exact algorithms of the search engines are kept secret, however some essential aspects that contribute to the ranking of a web site within the search results are actually known. These aspects include the presence of the keyword in certain elements of a web site and the popularity of the web page within a topical environment. The practice of adjusting a web site for better search engine rankings is part of search engine marketing.

Search engine marketing (SEM) can fulfil the need for an increasing search engine ranking. It is a form of internet marketing that seeks to promote websites by increasing their visibility in the search engine result pages[1]. The method is widely used for improving the volume and quality of web site visitors through search engines. There are two clearly distinctive types of search engine marketing. The first type is search engine optimization (SEO) which improves volume and quality of web site visitors via natural search results, also called organic listings. The results are listed in the green block in figure 1 in the order which is defined by the search engines' algorithms. SEO includes that web sites are being optimized for these algorithms. The second type of SEM is search engine advertising (SEA) which is based on actually paying for advertisements next to the organic search results. In the results which are marked red in the figure above advertisements are listed which

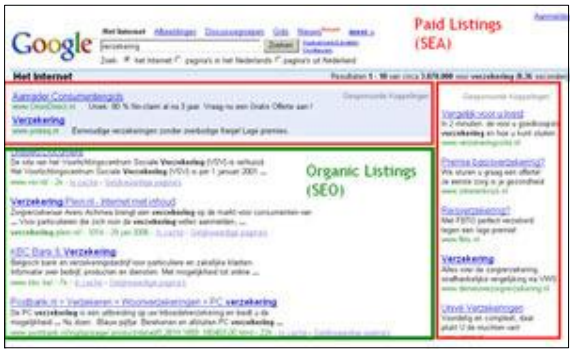


Figure 1 - SEO & SEA on a search engine result page

[1] Wikipedia: http://en.wikipedia.org/wiki/Search_Engine_Marketing (consulted 31-12-2007)

are set by advertisers for the entered search query. In short the order in which the advertisements are listed is determined by the multiplication of the price per click and the click through rate of each individual ad.

Search engine marketing becomes increasingly important in online marketing as consumers use search engines as a starting point of their online activities more and more often. The results of a British research from June 2005 pointed out that 87% of the Internet users (or Internet population) use search engines as their primary mean of finding sites (Hayward 2005). This acknowledges the importance of positioning a web site within the first search engine results. The earlier a web site appears in the search engine results, the more visitors will notice it and thereby will be able to click through to the web site. An eye tracking study by a Dutch search engine marketing agency has shown that the top results in a search engine are clicked on more than results that are ranked lower (Gisbergen 2006).

As mentioned above search engine optimization improves the number and quality of visitors via natural search engine results. Thurow (2007) argues that all major search engines use three components as part of their algorithms for determining search engine result rankings. These are the text, link and popularity component and can be optimized in order to increase search engine rankings aiming at an increase in web site traffic. According to Thurow the popularity component is the quickest way to achieve better rankings in search results. Search engines use the amount of inbound links to determine the popularity of a web site. The assumption is that popularity is closely correlated with quality, a more elusive concept that is difficult to measure directly (Pandey 2005). Each inbound link is considered to be a 'vote' for the web site. The popularity of a web site is used in the algorithms of search engines as a measure of relative importance of a web site, hence when the popularity of a certain web site increases it is deemed to be more relevant. The affiliate marketing broker M4N from Amsterdam created a service which increases link popularity through an extensive affiliate network. By stimulating affiliates to place hyperlinks on their web site the number of inbound links for the advertisers were boosted. This method of link building contributes to a naturally looking increase of the popularity component.

Even though search engine marketing companies own their right to exist to the benefits of increasing search engine visibility exceeding the investments in making this happen, actual numbers on the effect of search engine positioning on a web site's add value are unknown. This information however is essential for making any decisions concerning investments in search engine marketing. As existing theory about search engine marketing and the profitability of it is very limited, I find it very interesting to focus my research on these aspects. In order to define what methods are available for increasing web site traffic through search engines, I will perform an extensive explorative literature review based on both scientific as well as practitioners' literature. Different methods of search engine marketing will be discussed and costs and benefits for alternative methods of increasing traffic through search engines will be analyzed.

1.2 Research problem

The possible benefit of search engine optimization is an increase in the number of visitors to a web site. For transaction-oriented web sites increasing traffic may lead to increasing revenues. However there are also web sites that are not transaction-oriented. In such cases benefits can be found in the information that is being consumed (i.e. brochure downloads or newsletter subscriptions). An additional benefit of search engine optimization is that the improved search engine visibility contributes to the brand awareness among search engine users. This brings us to the essence of this research as it is the profitability of search engine marketing which needs to be defined. Investments in search engine marketing can only be accounted for when costs are exceeded by the total added value that is created. When the benefits from increased search engine rankings exceed the investments in SEM more investments can be made which in turn can fuel the search marketing branch.

Since there is no theory available that proves an increase in search engine ranking of a web site will result in an actual increase of the added value to a web site, this research will attempt to verify that. The central problem and forthcoming questions come together in the main research question:

How does a web site's search engine ranking affect the amount of visitors from search engines and the value of these visitors?

In order to be able to answer the main research question the following sub questions need to be answered. The first three questions are so called knowledge questions to provide background information for reference in the further research. The latter three questions will need to be investigated during this research and will be rephrased into propositions later on in this report.

Knowledge questions

1. What are the different methods of influencing search engine ranking?

2. What is the effect of each method on search engine ranking?

3. How can the added value of a high search engine ranking for a web site be defined?

Research questions

4. How does a web site's search engine ranking effect the amount of visitors from these search engines?

5. What is the effect of an increasing search engine ranking on the value per visitor of the web site visitors from these search engines?

6. What is the relationship between the amount of visitors from search engines to a web site and the total value of these visitors?

The research will be twofold; first there will be an exploration in the methods in which one can alter search engine rankings. Second there will be an analysis on the effects of increasing search engine rankings on the amount of visitors from search engines to the web site and on the web site's added value.

Definitions and terminology

Within the main research question there are a few terms which need further explanation.

Search engine ranking – The position of a certain web site within the result pages of a web search engine. A high search engine ranking means that the search engine algorithm deems the web site to be relevant for the entered key phrase. This will result in the web site being displayed early on the search engine result page (Thurow 2007).

Amount of visitors – The number of unique visitors from the search engines to the web site.

Value of visitors – As exact turnover numbers are highly confidential and not all sites are transaction oriented the value of visitors is defined as the quantity of completed desired actions on a certain web site. For some web sites the desired action is an actual sale where other web sites are focused on visitors filling in their contact information or subscribing to a news letter. In this manner all outcomes concerning the value of visitors will be shown in percentages of the same value at the beginning of the research period. The added value will be described in further detail in chapter three when the test cases are introduced.

A complete list of definitions and terminology concerning this thesis can be found in appendix A. During this research a direct link between the amount of visitors from search engines and the value of these visitors will be attempted to be established. Based on established literature and the findings in this research the most proficient methods to increase the amount of web site visitors through these search engines will be discussed.

1.3 Theoretical framework

Based on the research questions above the following three propositions are formulated to which the data gathered in this research will be related. The next chapter will discuss background theories for this research and chapter three will examine the methods for the analysis of the research data.

P1: An increase in search engine ranking will result in a significant increase in the amount of visitors to a web site through the search engine.

The first proposition states that increasing search engine rankings of a web site will evidently result in an increase of web site visitors through a search engine. The increase of visitors can be defined as significant when there is a correlation between the research results and the figures in table 3 and 4 on appendix D. This means that for the top nine search engine rankings any increase of one position in ranking on the search engine result page should immediately result in at least 5 percent more visitors for this proposition to be accepted. If an increase in the amount of visitors stays below 5 percent it will not be accepted as a significant increase. For an increase from the tenth to the ninth position in search results a minor decrease in web site traffic is usual since the tenth result is the last listing displayed on the first page. This result therefore receives a little extra exposure as users are more likely to see it before they pass on to the second search engine result page. It can be deemed plausible that this first proposition will be accepted during this research, as search engine marketing derives their right for existence from the intended increase in search engine traffic.

P2: An increase in the search engine ranking of a web site will result in an increase in the added value per visitor.

The second proposition concerns the relation between search engine ranking and the value that is added to a web site by visitors who visit the web site via the search engines. The purpose of this proposition is to find out whether assumptions can be made about the conversion rates of search engine visitors. As often is implied web searchers are not random visitors. When search engine visitors enter a series of words into a search engine query, they are actively searching for a specific product or service. Thus, the traffic a site receives from the search engine is already targeted (Thurow 2007). Targeted traffic is likely to have higher conversion rates, which will likely lead towards the acceptance of this proposition at the end of this research.

P3: An increase in the number of visitors from search engines to a web site will result in an increase in the total added value of these visitors to the web site.

This proposition states that the total added value of a web site will increase when the number of visitors from search engines increases, ceteris paribus. When there is an actual increase in the number of visitors to a web site, one might expect an increase in value that comes with these visitors. However this depends on the quality of the additional visitors. If the quality of the visitors remains

equal, the conversion may be commensurable to the number of visitors. Therefore this latter proposition is likely to be accepted.

All three propositions are – combined with the entities within the research question – graphically captured in theoretical framework in figure 2.

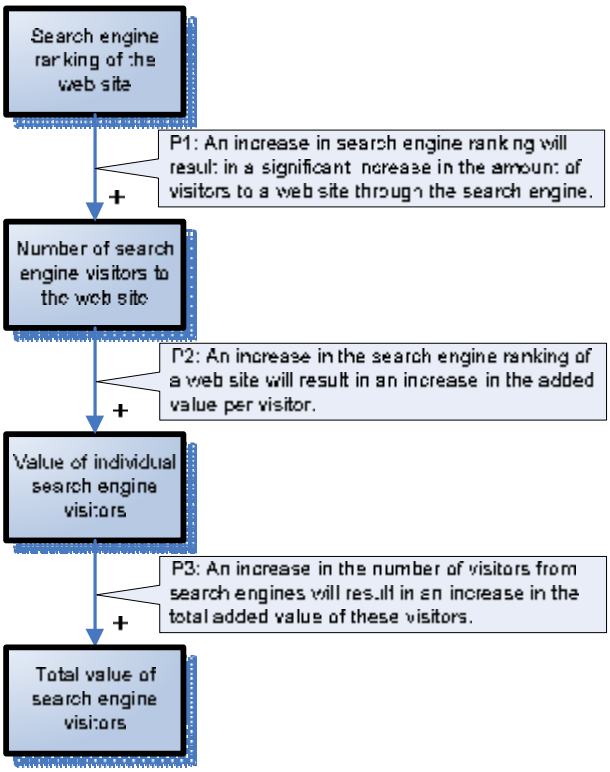


Figure 2 – Theoretical framework

1.4 Justification and relevance

Search engines are vital for generating quality visitors to a web site. It is widely thought that it is essential to be in the top three sites listed in the results from search engines (Chaffey 2006). As consumers increasingly make use of search engines in their search for web sites, a high search engine ranking becomes increasingly important. Despite of the relevance of search engine marketing, its profitability has not been written about in the academic literature.

In practice however it is quite important to be able to calculate return on investments on beforehand. In respect to accountability issues marketers prefer to be able to predict future revenues which will result from investments they make. For this reason proof of search engine marketing profitability is required. The motivation for this research is the need for insights on future profitability of search engine marketing in order to be able to justify investments in this area.

1.5 Delimitations of scope and key assumptions

During this research the effect of search engine ranking on the amount of visitors through search engines is investigated. For this reason only the search engine visitors are measured in order to get insight into the changes in search engine traffic when search engine rankings increase. Other visitors than those from search engines were neglected in this research as they do not contribute to solving the problem statement. Also the possible value of increased search engine visibility for matters of brand awareness was left out in this research. Although increasing visibility may add value for these matters, this effect was neglected as it cannot be measured effectively within the terms of this research.

The research was done among two customers of the affiliate broker M4N. These two parties were both part of very competitive markets, however the two markets were unalike and this research is by no means trying to draw conclusions for any specific industry. Further research focused on interrelated companies is needed to say anything about specific industries. The focus of this research is not to give any statistical confirmation of new theories but to explore the effect of search engine marketing in general and to create an overview of the impact of increasing search engine ranking.

As both companies who volunteered as test cases are fully focused on the Dutch market, only this local market has been investigated. Since the market share of Google within The Netherlands is 95 percent there is no need for measuring changes in positioning within the search engine results of any search engine other than Google. Any changes in other search engines' rankings will not result in any significant changes in the amount of web site visitors. Whether or not there are differences in search behaviour between different populations can be subject of further research.

Also it must be noticed that this research focuses on click through rates within the current search engine result pages. Although some trends concerning for instance local and personalized search will be discussed later on, research findings are based on Google's search engine result pages as they exist nowadays and therefore are only applicable to search engines that present results as a top down list of URL's. Also, among others the click through rate can be influenced by the meta description of a web page as this information is used for the description along with the URL in search engine result pages. During the research period the meta description texts of the test cases used in the study were not altered. However other parties on the search engine result pages may have altered their own description and can thereby have influenced click through rates and have slightly biased the results.

1.6 Summary

This first chapter laid the foundations for the rest of the report. It introduced the principles of search engine marketing which will be further covered in the following chapter and it also endorsed the importance of accountability of this type of online marketing. This matter laid ground for the research problem and was the basis of the research questions. After identifying those, the definitions further

clarify the exact meaning of the terminology as well as the importance of this research was justified. Next the delimitations of the research were defined. Based on these foundations the report will provide a detailed description of this research. In the next chapter a literature review will lay ground for the theoretical framework. After that chapter three will discuss all matters concerning research methodology followed by the actual data analysis in chapter four. All drawn conclusions and implications from this research can be found in the final chapter, chapter five.

2. Theoretical background

2.1 Introduction

As more and more internet users draw on search engines to navigate over the World Wide Web, the importance of these search engines is still increasing. According to Nielsen//NetRatings 81 percent of the global internet population visited a search engine in December 2006 (Thurow 2007) and this figure is still increasing. When an internet user makes use of a search engine he or she enters a certain phrase into the search engine. This phrase is commonly called a site's *keyword* or *keyword phrase*. When a keyword is entered into a search engine the search engine will determine the most relevant results for that query and display the results in order of supposed relevancy. Generally search engines will display ten results a page, dividing numerous results over various result pages.

Eye tracking studies (Gisbergen 2006) have shown that search engine users generally see the top results but omit to look any further. For this matter it is important to be listed at the top of the search engine result pages for those keywords relevant to ones website in order to receive any traffic from the search engines. In this chapter the methods to increase search engine visibility and traffic will be discussed. Following the introduction of search engines and search engine marketing, the methods and the effectiveness of each method will be presented. The effectiveness will be discussed in two subsequent stages. First, the effect of search engine ranking on the amount of website visitors will be construed. Second, the effect of an increase in the number of web site visitors on conversion will be discussed.

2.2 Parent theories / Literature review

2.2.1 Search engines

A search engine is a web site that uses spiders or robots to index web pages on the internet. Users can search the index by typing in keywords to specify what they are searching for (Chaffey 2006). Any pages that are deemed relevant by the search engine's algorithm are then listed and by clicking on a hyperlink the user will be taken to the site. This means that a search engine is build up out of three basic components: a spider, an index and a search interface.

The spider or robot is an automated script which browses the internet in a methodical, automated manner. Search engines use this so called spidering as a means of gathering data for their index. Any web page the spider finds is stored in the index of the search engine, after that the spider follows all hyperlinks on the page to index the underlying web pages. The index of the search engine is where the collected data are stored. When a search engine user performs a search he is not searching the web, but the cache of the web in the search engine's index. The search interface displays the results in the order that is determined by the search engine's algorithm. This algorithm is a complex formula which determines the relevancy of a web page to the submitted search query based on numerous known and unknown aspects, some of the known components will be discussed in the next paragraph

where search engine marketing will be covered. When the algorithm has determined which web pages are most relevant for a search query the results are displayed in a list of hyperlinks with a description of each web page.

2.2.2 Search engine marketing

The importance of search engines in the internet users' navigational activities emphasizes the need for optimal search engine visibility. The more search engine visitors will see a certain web site on the result pages, the more likely it will be that any of them will actually visit the web site. Hence, search engine users are already proactively searching for something which makes it even easier to persuade them to visit a web site as long as it is relevant to the submitted search query. Search engine marketing is focusing on increasing search engine visibility at that moment when potential customers are actively interested in products or services.

According to Thurow (2007) search engine marketing encompasses amongst others search engine optimization and search engine advertising as shown in figure 3. Although she also refers to matters like paid inclusion and optimization for alternative search engines, in the Dutch market – where Google has a market share of 95 percent in September 2007[2] – search engine optimization and search engine advertising are the most relevant search engine marketing activities.

Search engine optimization concerns dealing with the three main components of search engine algorithms which are shown in figure 3: the text component, the link component and the popularity component.

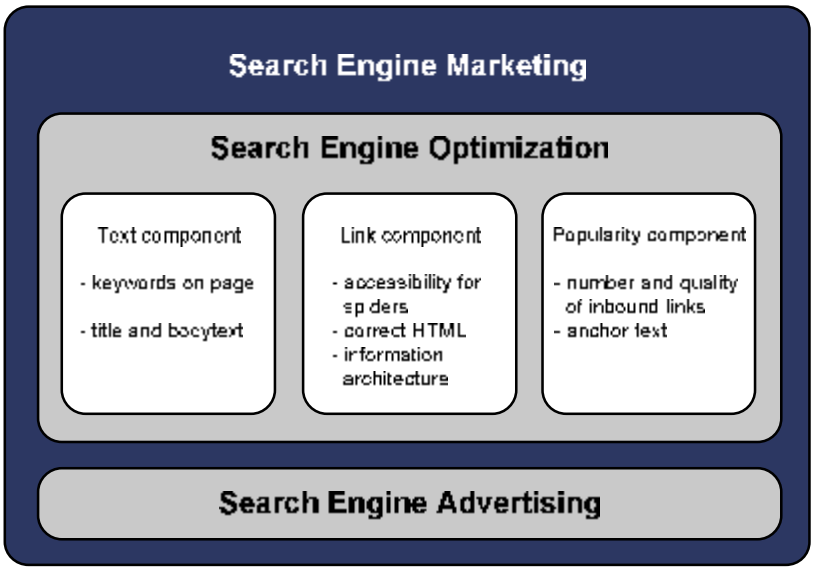


Figure 3 - Search engine marketing

The text component is based on the presence of keywords in the HTML code of a website. In order for a search engine to find a web site to be relevant for a certain keyword it should contain at least one

[2] Dutch National Search Engine Monitor, available at: http://www.checkit.nl/nationalesearchenginemonitor.html

but preferably more copies of that specific keyword. A website consists out of several components which possibly can all contain keywords. The title and body text of a web site are the most important parts for search engine optimization as these are visible to the end user's eye and search engines place significant weight on these tags. The weight of other tags – i.e. anchor text, alternative image text, domain and file names – is less important for determining keyword relevancy. The quantity of a certain keyword and its portion in the total amount of words on a web page together make up the keyword density. If there are more copies of a keyword on a specific web site then the keyword density will increase. Since it will be likely that the web site is about the topic of that specific keyword a search engine will be more likely to deem that web site relevant for this specific keyword. However as this so called keyword density increases it must be assured that the text stays relevant for the end user, too many keywords on a single web page appears unnatural and risks to be flagged as spam. Whenever a search engine algorithm flagged a web site to contain spam – even when it is not – the web site is most likely to be removed from the search engine's index. Prior to the start of Google search engines were primarily ranking web sites based on their textual content. This for instance led to web sites ranking for certain keywords – even though they did not cover that topic – only because the keyword was repeated over and over again at the bottom of the web page or in the so called *meta tag*. After the introduction of PageRank by Page and Brin (1998) search engine algorithms became increasingly efficient in ranking web sites based on their topical relevance instead of pure on-page content. This has thereby ended most of this on-site spam. Even though the impact of text inside the meta tag on search engine ranking can be disregarded these days, the text has quite some impact on click through rates in the search results as search engines often use this text for the description near links on their result pages.

The link component is the second so called on-page factor influencing search engine ranking. This aspect is primarily about the accessibility of the web site. The importance of this factor is drawn up from the fact that it is useless to place keyword-rich text in web pages if search engine spiders have no way of accessing that text. Therefore it must be assured that all manners of navigation are functioning for both the target audience and the search engine spiders. In practice this means that there should always be a navigational scheme using correct HTML, possibly in addition to JavaScript, image maps or flash as search engine spiders often do not follow links inside these latter forms of navigation. Next to actually granting access to a web page, the interrelation of links on a web site also writes up a scent of thematic relevancy. In other words, a web site's information architecture is the core of propagating the web site's themes and building up a network relevant to the subject it is about.

In line with the internal link structure the external link structure also influences the search engine ranking. This off-page component is called the link popularity or popularity component. The link popularity of a web page can be defined as the number and quality of links pointing to that web page. Attaining an optimal popularity component is not simply obtaining as many links as possible to a web site (Thurow 2007). The quality of the sites linking to a web site is more important than the quantity. In order to measure the relative importance of web pages, Page and Brin (1998) proposed PageRank as

a method for computing a ranking for every web page on the internet. A page has high rank if the sum of the ranks of its backlinks is high. This covers both the case when a page has many backlinks and when a page has a few highly ranked backlinks. Page and Brin were the founders of search engine Google which uses this PageRank principle as one of the main criteria in their search engine algorithm. In addition to the mathematical foundation of PageRank, the 'weight' of a web site linking to another web site is also determined by the topical relevance of the linking site. The latter criterion is becoming more important over time. Compared to the first two components the popularity component is the single most important part of achieving a high ranking website in modern search engines (Wall 2007). The affiliate broker M4N – in whose mandate this research was done – contributes to the link popularity of its clients by both stimulating affiliates to place hyperlinks to the clients' web sites and by propagating non affiliated web sites to create links to those same web sites.

Next to optimizing for the organic rankings it is also possible to advertise in search engines. Search engine advertising concerns pay-per-click listing systems similar to conventional advertising. When the user of a search engine types in a specific phrase a relevant ad with a link to a company page is displayed next to the organic search engine results. The paid listings are usually labelled as 'sponsored links' but the advertiser does not pay when the ad is displayed. Only when the ad is clicked on which then leads to a visit to the advertiser's web site the advertiser has to pay a fee, hence pay-per-click (Chaffey 2006). The relative ranking of paid search is based on a combination of the highest bids on specific keyword phrases and the click through rates of the ads. In addition to listings near search engine results the listings can also appear on other websites. Any webmaster can put so called contextual advertisements on his or her web site by placing some code of for instance Google AdSense or Yahoo! Content Match on their web site. The advertising network will automatically display relevant ads based on the page content. Again, these advertisements can be placed on a CPC (cost per click) or sometimes CPM (cost per million views) basis.

2.2.3 The effectiveness of each type of search engine marketing

For the three types of search engine marketing that can be distinguished – on-site search engine optimization, link building and search engine advertising – the effectiveness will be discussed based on writings of practitioners. Statements are based upon confirmed findings and affirmed opinions of practitioners where academic literature falls short to provide the information that is needed.

Although a web site always requires inbound links in order to rank well, in some niches optimizing on-site only can make a site rank better. Some niche fields have little competition and if there are not so many competing web sites in a certain field, by only performing on-site search engine optimization an increase in search engine ranking might be possible (Wall 2007). When an adequate link popularity is present the web site itself can be optimized by tweaking web page metadata and web page content. Which techniques will provide optimal ranking results is hinted at on the internet but none of the current literature – mostly provided by commercial firms – provides details about any empirical research on which their recommendations might be based (Zhang 2005). Zhang was among the first

to do research identifying web page design factors that impact ranking on search engine result pages. They concluded that keyword frequencies, keyword placement – i.e. in title, in body text or in both – and keyword textures all affected the search engine ranking of the web page on the keyword. When the number of duplicated keywords in a web page title increases, its visibility in the search engines increases up to three duplications. Concerning the body text of a web page findings were similar however no diminishing returns were found with body text keywords. In relation to keyword placement web pages which contain the keyword in both the title and the body text achieve better search engine ranking than those which contain the keyword in only one of these. When a keyword is placed only in one of these two parts of a web page, then a web page with the keyword only in the body text will perform better than a web page with the keyword only in the title. According to Zhang changing font case, font size, font colour, plural forms, or adjectives has no significant effect on search engine visibility. Although search engines seem to be blind to design features giving extra attention on keywords in the body text by means of putting them within bold or heading tags can have a positive influence on search engine ranking.

In order to rank well though – even in niches – the link popularity is the most important aspect (Wall 2007). Therefore a decent link base is essential for any site to rank well in search engines. To measure a web site's link popularity Google uses so called PageRank. PageRank is a method of valuating web pages by means of their relative importance, based on the amount and quality of hyperlinks pointing to that page. This method is based on citations as we know in academic literature, where an articles importance can be determined by both the number of sources citing the article as well as the importance of the citing sources themselves. A web page can have a high PageRank if there are many pages that point to it, or if there are some pages that point to it and have a high PageRank (Brin 1998). To deal with misuse of the PageRank principle (i.e. spam and artificial link building) Google has enhanced its algorithms to incorporate topical relevance. For this reason inbound links from web sites that are topically related have a greater value for increasing search engine ranking than non-related inbound links.

Search engine advertising has evolved to satisfy users' need for relevant search results and advertisers' desire for qualified traffic to their web sites (Fain 2005). After graphical banners being introduced to the web in 1994 search engines relied on these banner advertisements as primary resources. This faced the search engine with a dilemma, keeping users on the site as long as possible to generate banner views or send these users promptly to the sites appearing in the results. Paid search has reconciled this dilemma by tying the search engine's revenue to the act of transferring the user to an advertiser's web site. Jansen (2005) indicates that sponsored results are just as relevant as non-sponsored results for searcher queries. However research also indicates that web users have a negative bias against sponsored links. There is a strong preference for non-sponsored links, with searchers viewing these results first more than 82% of the time (Jansen 2006). Nonetheless paid search has become the dominant form of online advertising (Animesh 2007). Fact is that any advertiser can get a top position in paid search instantly, as opposed to the slow wait one is

confronted with in optimization for organic search. This flexibility and speed is vital for many organizations. In addition the appeal of low risk levels and the ability to set daily budget limits serve smaller advertisers, who also appreciate this method in that they can use it flexibly without being heavily committed to any party (Laffey 2006).

2.2.4 The added value of search engine marketing for a web site

Increasing search engine visibility can create value in different ways. In addition to monetary value of the visitors to a web site one could also consider matters like brand awareness, time spent on the web site and quality perception to add value to the organization behind the web site.

A better search engine ranking does not only result in more visitors, it also adds to the users' awareness of a brand. Whenever a web site ranks high in the search engine results, people are not only more likely to click on it but also it is also more probable that they just see the listing of the web site. Thereby search engine marketing can also increase brand awareness. Nonetheless it is widely discussed that brand awareness is hard to value in monetary terms. For this reason the value of brand awareness will not be accounted for in the results of this research. Another important aspect of higher ranking in search engines is the perceived quality of a web site by internet users. It is a tendency of internet users to simply trust the ranked output displayed by a search engine without any in-depth analysis or comparisons of the retrieved results (Pan 2007). The users' trust in Google's ability to rank results by their true relevance thereby also strengthens the image of web sites with a high ranking. In fact, according to the Dutch blog Dutch Cowboys 36 percent of the search engine users believe that the top search results are actually the best brands[3]. This might in turn result in higher conversion rates among the top search results.

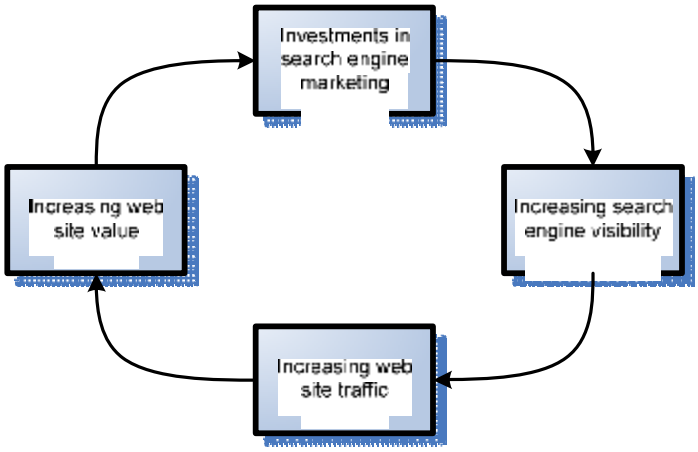


Figure 4 - Business model for search engine marketing

Nonetheless in order for any organization to be able to invest in search engine marketing the added value must at least be partially monetary. The relevant business model for an organization investing in

[3] Dutch Cowboys: http://www.dutchcowboys.nl/events/12946

search engine marketing is shown in figure 4. The cycle shows that an increase in search engine visibility should incorporate an increase of web site traffic and forthcoming added value. Only when the value added to the web site increases additional investments in search engine marketing can be justified.

2.2.5 The effect of search engine ranking on the quantity of web site visitors

When the methods of increasing organic search engine ranking have been applied as discussed above although possibly dampened by the level of competition a web site will rise in the search engine result pages. Whenever a web site is displayed early on the search engine result page this will increase its search engine visibility. In this paragraph we will discuss the effect of this increase on the amount of web site visitors from search engines.

According to Weinreich et al (2006) web users are more likely to click in the upper left corner of a computer screen than anywhere else. Based on their click study which is shown in appendix C it can be assumed that this line of reasoning will also be applicable to the search results in a web browser. Hence an increase in search engine ranking will lead to a more prominent display in the list of search engine results which in turn would probably result in an increase in the amount of visitors.

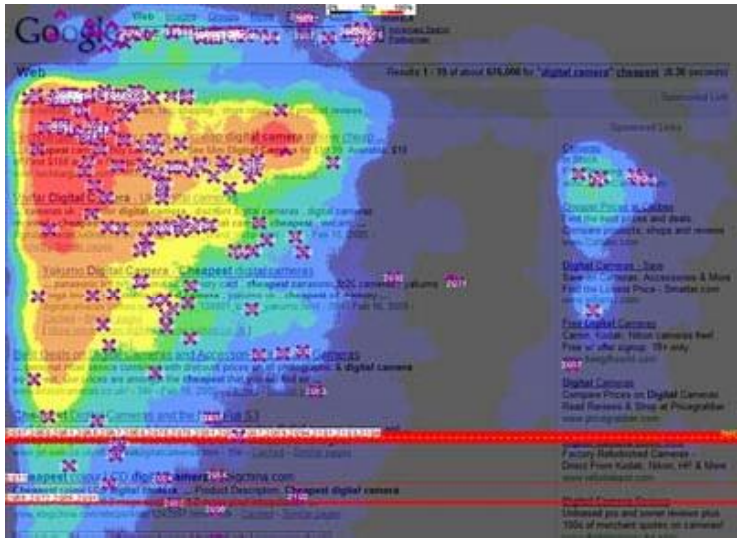


Figure 5 - Google eye tracking studies by Enquiro Research

In fact eye tracking studies shows that an increase in search engine ranking will enhance search visibility and increase click through to the web site. Figure 5 displays the results of an eye tracking study by Enquiro Research[4] where the red coloured area gets most attention and the crosses show where the test users clicked their mouse. Lorigo et al (2006) argue that in 96 percent of search engine queries, users looked only at the first Google result page. Most users viewed the first and second results rather equally in frequency, however they choose to click on the first result more often. Their results indicate that for each query only the most highly ranked search results are likely to be exposed to the users. Research of Granka et al (2004) also showed the similarity in time spent viewing the first two search results. This again was in contrast to the substantially amount of additional clicks on the result ranked first. Figure 6 shows this phenomenon along with information about visibility of and clicks on the other top eleven ranked results. After the first two results the attention drops significantly and the click through rate already drops tremendously from the second result and down.

[4] Source: Enquiro Eye Tracking Report I: Google (available at http://www.enquiroresearch.com)

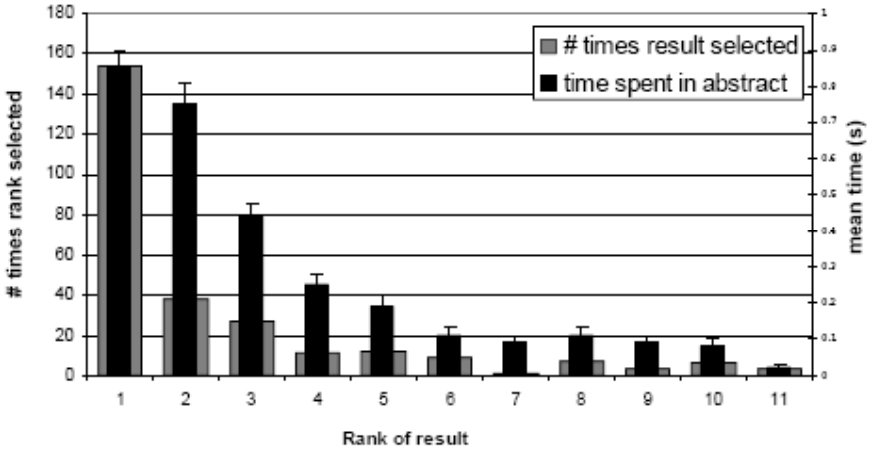


Figure 6 - Time spent viewing each search result with the frequency that the results are selected.

To support the findings in the experimental settings above, analysis of actual search engine log files will be incorporated. In August 2006 the search engine AOL (formerly America Online) accidentally released an extensive log file of their search engine. This log file included over 20 million search queries from 650,000 of their search engine users. Even though each search engine's user base has its own demographics some of the analyses of this log are valuable for general insights on search engine usage.

In an analysis of the search data AOL provided shown table 3 on appendix D it is confirmed that a number one position on search engine result pages accounts for 42 percent of the total amount of click through. The second place received just 12 percent of the total clicks. These findings closely correlate with the eye tracking study above. In this research we will investigate these findings using proposition 1 which is formulated in paragraph 1.3.

2.2.6 The effect of the amount of visitors from search engines on the value of these visitors

Whether a web site has a commercial goal or not each visitor has a certain value as it is supposed to perform a certain action, regardless of this action being the gathering up information or actually acquiring a certain product or service. For this matter any increase in the amount of visitors will immediately add to the value created by the web site. The value of additional visitors coming from search engines partly depends on the costs of the alternative. Acquisition costs of similar visitors from sponsored links vary substantially among different markets. Web sites operating in markets with high levels of competition experience higher costs when buying a similar amount of web site traffic from advertisement space within search engines (Jansen 2007). Therefore an increase in search engine ranking may be more valuable for web sites operating in markets where the acquisition of visitors from sponsored links is relatively high.

On the other hand the value of additional visitors coming from search engines can also be determined based on actual transactions made by search engine visitors. As Jansen (2007) described search

engine users are specifically willing to perform some web-mediated activity, hence they are already actively searching for something so chances are relatively high that the user's visit will result in a financial or informational transaction. Whether or not these aspects will result in a higher value per visitor will be tested in the second proposition, which was formulated in paragraph 1.3. This proposition will be tested during this research and the results are presented in chapter 4.

2.2.7 The future of search engine marketing

It has already been put out that this research focuses on search engines in the form we are currently familiar with. This means that search engine result pages are based on one massive index which is listed top down in an ordinarily fashion in line with what the logarithm has decided to be the most relevant results. Even though this all is an organic and naturally evolving phenomenon which is technically divided over many data centres, the result pages are quite identical for all users. As the internet is growing and search results need to remain relevant to the end users the search engine providers – such as Google – are developing new ways to organize the search engine results. Three of the most intriguing trends[5] among the search engines are explained in more detail below.

Local and vertical search

Local search is the natural evolution of the "yellow pages" directory advertising moving to the internet. Rising initiatives like iLocal and Google Maps function just like regular search engines, however they are set to cover only a limited set of possible results. This set of results is limited by the boundaries as declared by the search engine user, for instance a certain city or region resulting in geographically constrained searching. Local search confers to local operating organizations starting to act on the internet, thereby it is possibly an immense market where local companies can attract new customers. Vertical search is opposite to local search not based on geographical location, but based on the line of business an organization is in. These thematic search engines are primarily focused on delivering search results concerning a certain topic or branch. Examples of vertical search engines include services like Google Scholar for scientific articles, Yahoo Flickr for searching through images and eBay which focuses on (second hand) products.

Universal search

The vertical search engines as discussed above are gaining popularity, this is why generic search engines like Google and Yahoo are incorporating their own verticals into their main search engine. Opposite to the constrained search engines in local and vertical search, it is also possible to search among the different – otherwise separate – search engines all at once. The introduction of additional sources like video, images, news and maps in the search engine results is known as universal search. This means

Figure 7 - Google universal search

[5] Source: http://www.marketingfacts.nl/berichten/20070911_google_in_2010_en_de_gevolgen_voor_marketing

that in addition to the regular text links and abstracts on search engine result pages it now is also possible that images and screenshots are displayed. In figure 7 an example of a universal search result page is shown, a search for 'chewbacca' not only returns regular web sites but also gives results from Google image search at the top and a video at the bottom. This may have major impact on the click behaviour of search engine users as any image is likely to steal the focus which used to be centred around the top left corner of the result page. As mentioned above, eye tracking studies used to show that users start viewing search results in the upper left corner. Scanning search results in universal search may however start at the thumbnail instead of in the top left of the screen, resulting in deviating click through rates.

Personalized search

Another trend in internet search is personalization. This means that the listed search engine results are adapted to the individual search user's personal background. Therefore search engines already keep track of users' search history, with this information search engines get insights in an individual's preferences and fields of interest. By incorporating this information, search engines try to adapt to the personal preferences of each individual to retain customer satisfaction. For instance when a user frequently searches for car related queries, a search for *jaguar* will most likely return results about the car brand and not about the animal. This personalization can be enriched by information available in social networks like MySpace.com, which incorporates the fields of interests of friends and relatives. At this moment search engine personalization is already implemented in the paid search algorithm of Google. When for instance a search query like *discount* is preceded by a search for *LCD* the search engine will not only show results for the keyword *discount*, but incorporate the previous search for LCD as well.

For matters of search engine optimization this trend may have major impact on the business. When a general measure of search engine ranking disappears into each individual's personal search result page, this can affect the measurability of search engine optimization. Search engine marketers however are likely to adapt to this change and will focus on maintaining top search results. Instead of optimizing ranking for generic keywords for the entire purchasing process however, personalization may require optimization focused on more specific phases in the consumers buying cycle.

Another important aspect in online search is the behaviour of search engine users, which shows the impact search has on the society we live in. Since search engines are increasingly successful in serving relevant results for specified search queries, its users are more and more assuming that whatever result a search engine is serving that it in fact is the answer to what one was looking for. Over time this can result in users not double checking their findings anymore, as they blindly trust the search engines. Thereby the search engines have a major responsibility, as they have an enormous impact on what users find and thereby what they perceive to be the truth.

2.3 Summary

After introducing the search engine at the beginning of this chapter, the various practices within search engine marketing were discussed to answer the knowledge questions in the previous chapter. Search engine advertising is primarily effective on the short term, for instance when optimization for organic search is being set up. However in many situations, a proper search engine optimization campaign can provide a much greater return on investment (ROI) than paid search does (Wall 2007). A search engine optimization campaign consists out of two phases, first the web page content and structure can be optimized. Second, the link popularity can be increased preferably by gaining topically relevant inbound links. The latter action usually has most impact on search engine ranking.

If a web site has a high ranking in search engines its search engine visibility will be better which should lead to an increase of the amount of visitors from the search engine to the web site. Along with an image of Google's golden triangle in figure 5 the theory supporting the first proposition is covered. The increase of traffic from search engines in turn should lead to additional added value to the web site. The factor of this increase depends on the conversion rates of the newly attracted visitors. Since search engine visitors are deemed to be more relevant traffic which is likely to have higher conversion rates, one might suspect a more than commensurable increase of web site value when compared to the increase in the amount of web site visitors. The second proposition defined in chapter 1 should answer the questions concerning the average value of these newly attracted visitors where the third and final proposition will test the effect of increasing search engine ranking on the total value for the web site. This chapter was then concluded with an overview of current trends and the future of search engine marketing.

3. Methodology

3.1 Introduction

The research goals are twofold, firstly trying to understand how search engine ranking can be influenced in the most profitable manner, secondly finding out what the effect of an increasing search engine ranking is on matters such as the amount of visitors and the value created by these visitors. This bilateral nature is mirrored in the research methods in which one can find two distinctive methodologies. Firstly a literature review will be executed to answer the primary knowledge questions and secondly a multi-case study will be carried out to investigate the second part of the research and answer the research questions.

3.2 Justification

To answer the first two knowledge questions of the research problem – concerning methods of influencing search engine ranking – a literature review was conducted to cover the aspects of search engine ranking. In the previous chapter both search engine ranking and search engine marketing were discussed. The literature review led to more explicit insights about the topic of this research. Based on these insights three propositions were constructed which are required in the case study part of this research.

These propositions will be part of the case study which will be performed to answer the main research question. According to Yin (2003) case studies are the preferred research strategy when a 'how' question is being posed, when the investigator has little control over the events, and when the focus in on a contemporary phenomenon within some real-life context. The case study is a way of investigating an empirical topic by following asset of pre-specified procedures, these procedures will be put out in the following paragraphs.

3.3 Research procedures

As mentioned in the introduction of this chapter there is a distinction between the research method for the first research questions and the methods for the second part of this research. The first knowledge question will be answered using an extensive explorative literature review on possible approaches to increase the amount of visitors to a web site through search engines. The starting point of this exploration has been the book 'Search Engine Visibility' by Thurow (2007) as this book discusses all basic methods to improve search engine positioning. The most potent methods of improving traffic towards a web site through search engines are discussed in the second chapter by means of their ability to improve search engine rankings. With this analysis the second knowledge question from the first chapter will be answered.

As mentioned above the research questions will be answered based on findings in a case study. Because the stated theoretical framework does not focus on either critical or unique cases as well as it does not imply to be representative for a wide base of cases, a single-case design is not the optimal type of case study for this research. The evidence from multiple cases is often considered more convincing which will make the overall study to be regarded as more robust. With multiple cases it is also possible to follow replication logic, when uncovering a significant finding from a single case this finding can be replicated in a second, third or even more cases. If each case gives similar results literal replication will strengthen the theoretical framework.

3.3.1 Case study design

In case studies five components are especially important during the design process. First the study questions (1) need to be well formulated. This resulted in the main question capturing how a web site's search engine ranking influences the amount of visitors from search engines and the value of these visitors. The fact that the question is in a 'how' form also empowers the plan to answer it by means of a case study. Second, propositions (2) have been established at the end of chapter two to answer the question and find the right direction for the research. Collected data will be analyzed and judged against these propositions in order to answer the main question.

The propositions are as follows:

P1: An increase in search engine ranking will result in a significant increase in the amount of visitors to a web site through the search engine.

P2: An increase in the search engine ranking of a web site will result in an increase in the added value per visitor.

P3: An increase in the number of visitors from search engines to a web site will result in an increase in the total added value of these visitors to the web site.

The third component consists out of the definition of what the 'case' is. As already discussed above this research will be based on a multi-case study. Within this study the units of analysis (3) will be *the web sites' search engine rankings* as each web site has a certain ranking in search engines for certain keywords which will generate a certain amount of visitors who in turn will contribute a certain value to the web site.

The case studies take place among customers of the affiliate marketing broker M4N and are chosen based on availability. The two test cases are part of two different but both highly competitive markets. During the research period the search engine ranking of the two test cases was optimized in two ways. Firstly on the web sites itself both the text component and the link component were analyzed as discussed in the previous chapter. On-site attributes were altered in such a way that the web sites itself were optimized for search engines. Then secondly the link popularity of the two web sites was

enhanced through a service of M4N. Within this service the affiliates are stimulated to refer to the web site of the advertiser in order to increase the popularity component. Therefore many web sites that are topically related or are widely perceived as highly authoritative are contacted to ask for a link to the web site that is being promoted. As mentioned in chapter two not only the quantity of inbound links is important, the quality of these new links is crucial as well. Therefore the researcher closely monitored the quality and topical relevance of these newly created inbound links to ensure a beneficial effect on search engine ranking.

The web sites that took part in this research will now first be covered and after that the determination of the added value of additional visitors for that web site will be discussed. For reasons of confidentiality both companies will be represented by a dummy name.

Case #1 – SimOnline
The first web site is a sim only – telecommunication – comparison site for consumers. Visitors can search for the cheapest offer available among many different web shops and will be forwarded to their selected offer. SimOnline will be rewarded whenever a visitor from this web site actually performs a transaction on the web site he or she is forwarded to. The number of these rewarded transactions measures the added value for this web site, this information is available through the back office of the organization. Data was collected over a period of 16 weeks in which a total of almost 10.000 visitors viewed over 46.000 pages.

Case #2 - CarSafety
The second web site that is part of this research concerns an insurance company. For reasons of confidentiality no further details about the exact case will be published. However the web site was subject to a steady increase in search engine ranking during the research period. Data was collected over a period of 25 weeks in which search engine ranking was enhanced from the tenth to the first place in Google.

When all data about ranking, visitors and added value is gathered as described in the following paragraph this data needs to be linked to the earlier stated propositions (4). Therefore the method of pattern matching will be applied which means that for each proposition it will be discussed whether or not each single case supports it. This pattern matching will be illustrated in the following chapter. If two cases support the same theory, replication may be claimed. So if the gathered data does not reject the propositions they can be taken for granted as multiple sources of evidence for the existing theory (5).

3.3.2 Data collection

As mentioned before the case studies will take place among customers of the affiliate marketing broker M4N. During the research period the search engine ranking will be enhanced through link building. The effects of the increase in search engine ranking on the added value will be measured at an interval of one week. The length of the research period varies as the time in which a certain web site can rise in the search engine results very much depends on the level of competition. This explains

the difference between the lengths of the research periods of the two test cases. The first test case took 16 weeks of measurements where the second test case lasted 25 weeks. When competition is relatively low an increase in search engine ranking will be possible much more rapidly which lowers the necessity for more extensive measurements. The number of visitors will be measured and the added value will be drawn from the back offices.
For assessing the search engine ranking of the web sites a software application called Advanced Web Ranking[6] (AWR) is scheduled to gather up the top 50 results in Google Netherlands for the relevant search queries at the beginning of each week during the entire research period. AWR checks each top 50 result list on the presence of the relevant web sites which over time gives a timeline with search engine ranking for each test case.

Next Google Analytics[7] which is a web site analytics tool offered by Google will be used to determine the amount of traffic from Google for each specific keyword over the entire research period. Within the report 'Traffic Sources Overview' in Google Analytics the sub report for the organic – non paid – Google results is exploited. This gives an overview of visits per keyword for a specified period of time. As this period can be altered to get the required information, the amount of visits from Google for the specified keywords was measured for each week in the research period. This eventually led to a timeline with the amount of visits for the specific keywords of the test cases.

Exact figures about web site visits in web analytic tools often differ from one tool to another, this is the result of differences in measurement methodology. Most web analytics software use JavaScript and cookies to measure the amount of visitors to the web site. However if a user has disabled the browser's ability to accept either JavaScript or cookies, these visitors are not accounted for. For this reason some web analytics suppliers have included alternative measures, such as IP tracking or image serving instead of JavaScript. Another reason for deviations in visit metrics is the result of dissimilarities in the definition of what is a visit. For instance some organizations define a visit to be any web site visitor requesting for one or more web pages within a period of 30 minutes. If this same visitor requesting another page after 30 minutes he or she will be accounted for as a new visit. However when another organization sets the maximum measurement period for a visit at one hour, that same visitor who had just created two visits in 40 minutes will now be accounted for as one visit.

Although these differences may lead to inaccurate and dissimilar visitor statistics in web analytics, analytics software does give good insights in the relative amounts of visitors. Assuming the same metrics are used each time, it is safe to say web analytics give good insights in trends and analysis of trends. To ensure that conclusions in this research are drawn based on valid information in addition to Google Analytics other web analytics software are used to validate the information in Google Analytics. This is done in the first test case where the extra analytics software called Clicky[8] was used

[6] Available at: http://www.advancedwebranking.com
[7] Available at: http://www.google.com/analytics
[8] Available at: http://www.getclicky.com

as a secondary measurement. These additional measurements will be compared with the relevant Google Analytics measurements in order to enhance objectiveness and reliability.

Eventually to be able to determine the added value of an increase in search engine visibility for the first test case the added value was withdrawn from the related organization's back office. Unfortunately the organization behind the second test case was unable to return figures concerning added value as it was unable to allocate their sales figures to their traffic sources. For confidentiality reasons the figures concerning added value are rewritten to percentages where the first week of the research period is set at 100 units.

3.3.3 Collecting the evidence

The next step in the case study research process is collecting the evidence. This comes down to three important principles which support the construct validity and reliability. First there is need for multiple sources of evidence, when the same information can be collected from multiple sources this will corroborate the findings. This aspect is addressed by combining the findings in literature – the documentation – as shown in the theoretical framework and the actual case study results – the observations. The two sources will merge when assessing the propositions.

Secondly, all collected data and information about the circumstances in which the data was collected needs to be publicly available in a case study database. Such a database increases the reliability of the entire study as it facilitates independent inspection of the raw data on itself without the limitations of the written case study report. By clearly defining the circumstances in which the data collection took place the investigator is aware and obligated to rule out bias at all times. Finally the link between the report and the initial case study questions should be clear at all times maintaining the chain of evidence. It should also be possible for any reader to follow the evidentiary process backward, for instance if one would like to know more about the basis for the conclusions. During the research this chain can be secured by consistently following the procedures and research questions set at the beginning.

3.3.4 Analyzing case study evidence

As discussed Google Analytics measures the visitors per keyword over a certain period of time. Search engine ranking is also measured over that same period by Advanced Web Ranking. Matching the two timelines will result in a data collection of the number of visitors set out against the search engine ranking the selected keyword. This analysis will either support or reject the first proposition (P1). As multiple cases will be analyzed replication logic can be applied which will strengthen the external validity.

The second proposition (P2) will put the figures concerning added value per visitor up against search engine ranking timeline as delivered by Advanced Web Ranking. To determine the added value per visitor first the added value per keyword needs to be established from Google Analytics statistics and sales figures. Therefore the total added value will be divided in proportion to the share each keyword

has in the total amount of traffic from search engines. Next this added value per keyword needs to be divided by the number of search engine visitors on that keyword. The average added value per visitor should either stay on the same level or increase when search engine ranking increases in order for the proposition to be accepted. If the average added value per visitor decreases when search engine ranking increases the third proposition will be rejected.

To assess the third and final proposition (P3) the number of visitors from search engines will be drawn from Google Analytics. These figures will be put up against the relative numbers – i.e. percentages – of added value. The total added value should increase in order for the proposition to be accepted. If the total added value either stays at the same level or decreases when the number of visitors from search engines increases the third proposition will be rejected.

3.3.5 Reporting

When all procedures above have been applied a case study report can be put up. To make it an exemplary and successful case study it must be significantly important and of general public interest. Since search engine optimization is a very popular marketing activity this first requirement has been met easily. The report will contain sufficient evidence to support the conclusions as well as it should give a complete overview of the events that are investigated.

3.4 Ethical considerations

In order to collect useful and reliable data in competitive markets certain levels of confidentiality need to be embraced. Therefore figures concerning added value in the form of actual sales were rewritten into percentages.

3.5 Summary

In this chapter the research procedures have been clearly defined. The main aspects of a case study design stood at the basis of the founded procedures. Through these procedures the propositions that were formulated in the previous chapter can be tested. Therefore the cases that take part in this study – a telecommunication comparison site and an insurance company – have been introduced in this chapter as well. Also the procedures for data collection and analysis have been explained in order to set up a reliable investigation. The procedures that were set up in this chapter will be executed in the following chapter where data will be analyzed which leads to the conclusions in the fifth and final chapter.

4. Data analysis

4.1 Introduction

In this chapter the gathered information will be analyzed to make it possible to draw conclusions from it. For each proposition the relevant data will be put together according to the procedures specified in the previous chapter. First the findings concerning search engine ranking and the number of visitors will first be analyzed to find patterns on proposition 1. The search engine ranking and added value per visitor will provide data for the second proposition and finally the total added value will be set off against the number of search engine visitors to test the third proposition.

4.2 Collecting the data

According to the methodology in the previous chapter the data is collected from a variety of sources. For a period of 16 weeks the search engine ranking of the test case SimOnline have been measured using the software package Advanced Web Ranking. The results of this data collection can be found in the column 'Ranking' in table 5 on appendix E. Simultaneously to measuring the ranking the amount of visitors was drawn from both Google Analytics and Clicky. These figures were respectively placed in the column 'Visits Google Analytics' and 'Visits Clicky' of this table. As explained in the previous chapter the figures in these two metrics can deviate, however it is important for the decision making process in this research that the trends in these two measures do correlate. Therefore the amount of visitors measured in Google Analytics and in Clicky were put together in one figure for both keywords that were measured. Figure 8 gives an indication of the correlation between the two measurements. Both figure 12 and figure 13 on appendix F show a strong correlation between the measurements in Google Analytics and Clicky. Thereby the figures from Google Analytics are validated and it is safe to draw conclusions based on these numbers. In the last column of the table on appendix E the relative amount of sales are given, these were withdrawn from the back office of the organization.

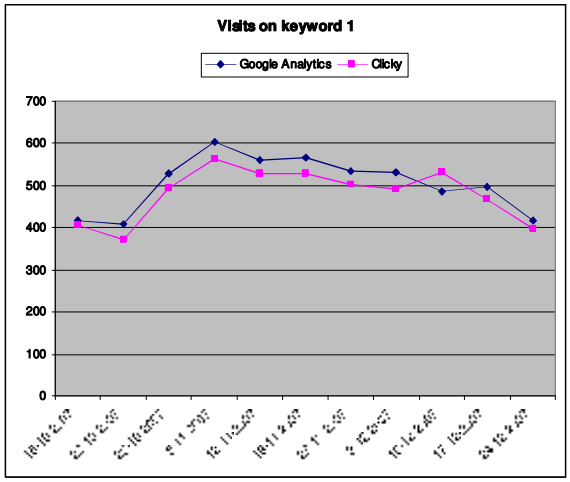


Figure 8 - Google Analytics and Clicky compared

For the second test case – concerning CarSafety – measurements took place over a period of 25 weeks. In table 6 on appendix G the results for this test case are presented. The amount of visitors during the research period were also shown in figure 14 on appendix H. Based on this data of these two test cases the propositions will be validated.

4.3 Patterns in data on proposition 1 (P1)

The first proposition states that an increase in search engine ranking will result in a significant increase in the amount of visitors to a web site through the search engine. When a search engine ranking of a web site for a certain keyword is increasing this does not necessarily mean that this keyword will rise through all possible rankings. For instance it is very well possible that a web site's ranking for a certain keyword increases from the twentieth to the tenth place overnight. Also it must be noted that during this research search engine ranking was measured at an interval of one week. For these two reasons it is not possible to give an exact overview of increasing traffic as a result of step-by-step improved search engine ranking. However as the research period was quite extensive search engine traffic for certain keywords can be based on rankings for a more extensive period of time. In order to rule out coincidental and seasonal influences traffic was averaged over several weeks.

For the SimOnline case several keywords entered the top 10 in the search engine result pages of Google Netherlands. For each rank the web site had on the search engine result page the amount of visitors from the search engine was measured as put out in table 5 in appendix E. Each shift in search engine ranking towards the top results gives a significant increase of traffic. In order to test the stated proposition the results from the two test cases are compared to the figures in the AOL case. Therefore in both test cases the shifts in search engine rankings were combined with the relative amount of visitors from search engines. These relative amounts were calculated based on the original figures in table 5 and 6 on the appendixes and put into figure 9 below. The relative visitor amount that was drawn from the AOL investigation as is outlined in appendix D in included for comparison.

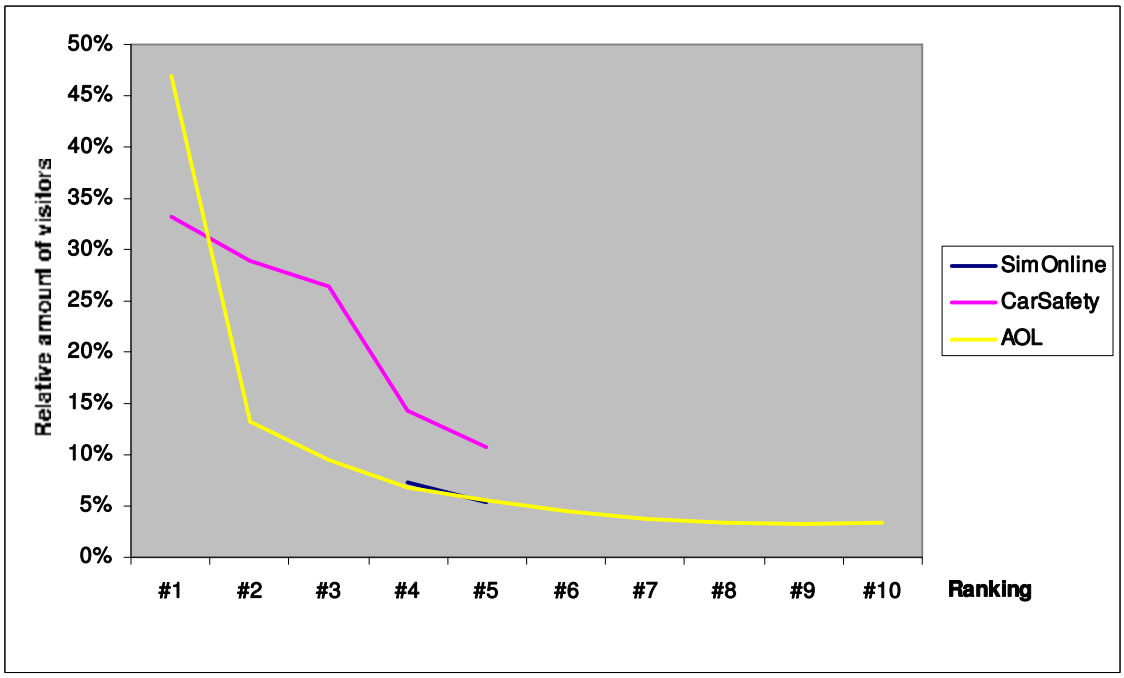


Figure 9 – The relative amount of visitors for each ranking in both test cases and the AOL results

In comparison to the AOL results the findings in the SimOnline case are slightly biased towards the top results as a higher search engine rank results in more visitors than predicted based on the AOL case. It must be noted that SimOnline ranked on the fourth place in the search engine results at the end of the search engine optimization process, for this reason no results are available for the SimOnline case for the top three rankings. On the other hand there is the case of CarSafety in which did provide reliable results for the rankings all along the top five. In this last test case click through rates on the search result pages seem to be a bit more evenly spread. The bias towards the top results that was shown in the SimOnline case is even more clearly present in the case of CarSafety. Click through rates on the results on the second to the fifth place are far higher than in the AOL case. However for the number one search engine result the click through rate is somewhat lower than the average drawn from the AOL case.

Based on the findings in the two test cases it is safe to say that an increase of search engine ranking will result in over 5 percent additional visitors from search engines. For this reason the first proposition in this research is being accepted in these two cases affirming that an increase in search engine ranking will actually result in a significant increase in the amount of visitors to a web site through this search engine.

4.4 Patterns in data on proposition 2 (P2)

To get insight into the conversion rates of visitors who enter the web site through a search engine the second proposition was drawn up. It states that an increase in the search engine ranking of a web site will result in an increase in the added value per visitor. For this proposition the search engine ranking has been set out against the amount of added value per visit. Therefore the figures concerning ranking, visitor amounts and relative sales from table 5 in appendix E were rewritten as shown in table 1 below.

Ranking	*Relative value per visitor*
#4	79,94
#5	89,45
#10	100,00

Table 1 – Relative amount of added value per visitor for the specific search engine rankings in case #1 (SimOnline).

This table contains the analysis that was done for both keywords in the test case of SimOnline. The relative sales numbers were divided by the amount of visitors which resulted in the relative value per visitor for each specific search engine rank. Figures concerning sales or added value were not available in the test case of CarSafety, therefore the analysis and evidence for the second proposition is based on the SimOnline case only.

The results show that for both keywords in the SimOnline test case an increase in search engine ranking has resulted in a decrease of the added value per visitor. When the search engine ranking for

keyword 1 increased from the 5th place to the 4th place in Google, the average sales per visitor went down from 7,68 to 6,86. Comparable results were found when the ranking for keyword 2 increased from the 10th to the 5th spot: again the value per visitor dropped. Even though these findings seem to be based on just a few measurements, it must be stated that the figures in table 1 are aggregates of measurements of thousands of visitors and hundreds of sales over a period of 16 weeks. Based on these findings the proposition stating that an increase in search engine ranking will enhance the added value per visitor is rejected. In fact an increase of in search engine ranking seems to result in a decrease of the value per visitor. As stated before an increase in search engine ranking implies getting more qualified traffic as search engine users are actively searching for a certain product or service. However increasing search engine visibility also raises the issue that a less targeted audience will also find and visit a web site. This bulk traffic might even add value to the web site, however in general it seems to dampen the average value per visitor.

4.5 Patterns in data on proposition 3 (P3)

Next to determining whether increasing search engine ranking results in more web site visitors and what the effect of these higher rankings is on the average value of each visitor, it is also essential to verify whether an increasing search engine ranking will actually add value to the web site. Therefore the third proposition was put out to assess the relation between the number of visitors from search engines and the total added value of these visitors. The third proposition states that an increase in the number of visitors from search engines to a web site will result in an increase in the total added value of these visitors to the web site. The figures concerning the amount of visitors and value are extracted from table 5 on appendix E for both keywords in the SimOnline test case. When the number of visits is put up against the total added value this results in figure 10.

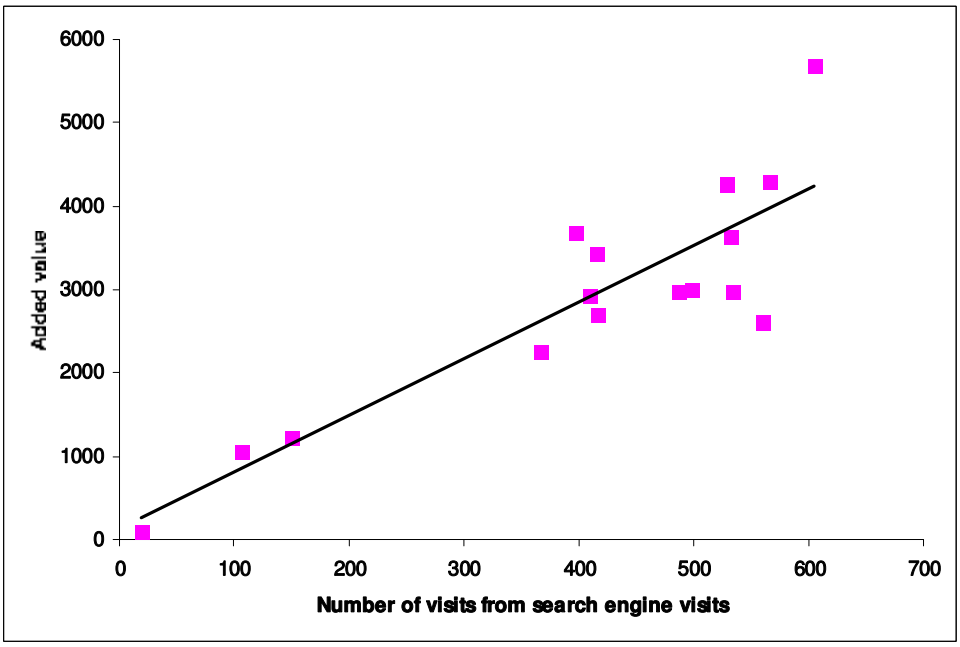


Figure 10 - Added value set of against the number of visits from search engine visitors.

On the horizontal axis the number of visitors from search engines in a predefined period of time is set out. Although added value has not been increasing uninterrupted with the rising number of visits the trend line clearly shows that an increase in the number of visitors from the search engine has a positive effect on the total added value. In addition figure 15 on appendix I affirms the findings by showing a comparable effect for the second keyword.

An extended version of table 1 is drawn up below showing that in the test case of SimOnline an increase in search engine ranking from the tenth to the fifth place resulted in over 63 percent additional visitors. This table 2 shows that the value of these visitors on average was decreased with 10,55 percent, resulting in an overall increase of almost 46 percent in total value when the keywords in this test case increase from the tenth to the fifth place on the search engine result page.

Ranking	*Relative value per visitor*	*Relative amount of visitors*	*Relative total added value*
#4	79,94	220,97	176,54
#5	89,45	163,08	145,79
#10	100,00	100,00	100,00

Table 2 - Relative amount of total added value for the specific search engine rankings in case #1 (SimOnline).

Even though the findings on the second proposition in this research learns us that increasing traffic through higher search engine rankings dampened the average value per visitor, it still is safe to say that based on the findings in this research an increasing number of visitors from search engines will actually increase the total added value to a web site. Thereby the third and final proposition is accepted.

4.6 Summary

In the data analysis in this chapter all three propositions were tested. In order to draw conclusions based on reliable information first the figures of Google Analytics have been validated. Therefore the traffic amounts that were measured using Google Analytics were compared with those in Clicky. The results showed corresponding trends in both web analytic tools, which means that it is safe to draw conclusions based on those figures.

Based on findings in this research the first proposition was accepted, which means that an increase in search engine ranking actually results in additional web site traffic. Opposite to prior expectations the second proposition was rejected. A higher search engine ranking did not only result in more relevant traffic but also attracted more bulk traffic which lowered the average value per visitor. Nonetheless did the increase of web site traffic outrun the decrease in value per visitor, therefore the overall value that was added to the web site by increasing its search engine rank grew significantly.

5. Conclusions and implications

5.1 Introduction

Search engine marketing becomes an increasingly important aspect of the online marketing mix. For this reason both search engine optimization and search engine advertising are entitled to receive more attention from academics and this is one of the motives for writing this thesis. For reasons of accountability it is essential to get insights in both the costs and the benefits of search engine marketing. This research seeks answers to questions that concern the relationships between the search engine ranking, the amount of visitors from search engines and the value that comes from these visitors. These three aspects are the cornerstones of this research and goal of this research is to find the possible relations between them.

Because Google has a market share of 95% in The Netherlands research will focus on this search engine only. Since this research was set up to explore this area of online marketing, no intention is implied to give any statistical data about specific industries or newly developed theories. This research should be considered as a general overview of existing literature and a hand vest for future research in the environment of search engine marketing.

5.2 Influencing search engine ranking

In order to influence the organic ranking of a web site search engine optimization has to deal with three main components. The text component determines the relevancy of a web page based on the presence of certain keywords in the text. Research has shown that both keyword frequency and keyword placement do affect search engine ranking. For instance repeating a certain keyword in a web site title up to three times will result in increasing search engine rankings for this specific keyword. The link component focuses on the accessibility of the web page for search engine spiders and stimulates the use of a decent information architecture using correct HTML. These first two components are the on-site components, optimizing these aspects takes place on the web site itself. Opposite to this is the popularity component, which happens off-site. Although on-site optimization may be enough to gain top position in search engines for some niche keywords, the link popularity is by far the most important aspect of search engine optimization. Every inbound link adds to the web site's relative importance and thereby enhances its search engine visibility. In general a decent link base is crucial to rank well, especially inbound links from topically related web sites are important for a web site to rank well in search engines.

Since the process of search engine optimization can take quite some time, alternatives may become relevant as well. As search engine advertising can drive traffic to a web site almost instantly many advertisers spend money on paid listings. Even though advertisers have to pay per click for getting listed in the sponsored section of a search engine, many of them prefer the flexibility and speed of

search engine advertising. An additional benefit of search engine advertising is that ranking in paid listings is based on a combination of the click through rate and the price per click, thereby advertisers have more say in their eventual ranking.

5.3 The added value of search engine marketing

Search engine visibility can add value in different ways, e.g. monetary value, brand awareness and perceived quality. Not only does an enhanced search engine ranking increase the probability that a web site will be visited and thereby increase its web site traffic, it also creates a scent of quality among internet users. Since search engine users almost blindly trust the output of a search engine query, they seem to perceive that a higher ranking actually stands for a better brand. Since a better perceived quality is likely to result in higher conversion rates, this aspect enforces the business model for search engine marketing. This cycle incorporates that investing in search engine marketing increases search engine visibility, which in turn should result in increasing web site traffic and forthcoming web site value. When value is added to the web site this can be reinvested into the search engine marketing.

Hence, the added value of search engine marketing can be defined as a combination of increasing traffic and an increase of perceived quality. Together these two aspects can lead to more converting visitors and thereby add monetary value to the web site. For non transactional or informational web sites value does not need to be monetary, nonetheless the perceived value and increasing traffic can both be very valuable for these types of web sites as well.

5.4 Increase in search engine ranking will boost the amount of visitors

When a web site has a high search engine ranking it is displayed early on the search engine result page, this will increase its search engine visibility. Since web users are more likely to click in the upper left corner of the screen, click through rates will be higher near the top results. Research has shown that 96% of the search engine users only look at the first result page, on these pages the first and second result are viewed most and rather equally. The first result gets by far most click through, from the second result down the click through rate drops tremendously.

By measuring the progress of web site traffic during the course of optimizing two test cases for search engines, the first proposition was tested in practice. The first proposition stated that an increase in search engine ranking will result in a significant increase in the amount of visitors to a web site from the search engine. In order to test this proposition the research findings were compared to earlier findings in the AOL case.

In the first test case regarding SimOnline findings were somewhat biased towards the top results in comparison to the AOL results. This means that search engine users clicked relatively more on the top results than in the AOL case. In the second test case concerning CarSafety this bias was not present, in fact the click through rate for the number one result was somewhat below the averages in the AOL

case. However an increase in ranking did result in additional visitors from the search engine. Based on these findings it is safe to say that any increase of search engine ranking will result in more than 5 percent additional visitors from these search engines. As was already deemed plausible in the theoretic framework, the first proposition has therefore actually been accepted. The results of the test cases support the figures from the AOL case, which are presented in figure 11.

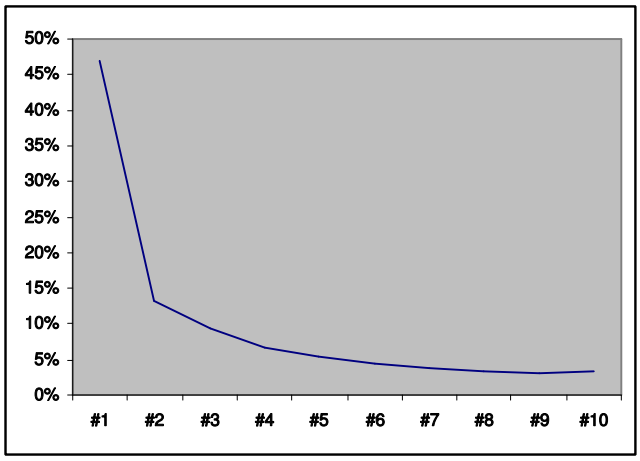


Figure 11 – Click through rates within top 10 results for each search engine ranking

5.5 Increasing search engine ranking will dampen the added value per visitor

Whether a web site has a commercial purpose or not each visitor has a certain value. When it is not possible to determine the value of online transactions, visitors can also be valued at the alternative acquisition costs for similar visitors. Otherwise the value can be determined by the average spending per visitor. Since search engine users are already actively searching for something chances are relatively high that these visitors will convert better than any other random web site visitor. Therefore when a web site has a higher search engine ranking it is likely to receive more targeted visitors which in turn could result in an increase in the value per visitor. The second proposition is based on this assumption and states that an increase in the search engine ranking of a web site will result in an increase in the added value per visitor.

This research has shown that an increase in search engine ranking results in a decrease of added value per visitor. Based on these findings the second proposition is being rejected. In fact an increase of in search engine ranking seems to result in a decrease of the value per visitor. The rejection of this proposition can be explained by the additional amount of bulk traffic that comes along with a higher search engine rank. Even though an increase in search engine ranking implies getting more qualified traffic, it also implies that a less targeted audience will find and visit the web site. This additional bulk traffic might even add value to the web site, however in general it seems to dampen the average value per visitor.

5.6 Increase in search engine ranking will improve a web site's added value

The third and final proposition of this research refers to the total added value of an increasing search engine rank. When there is an increase in the number of visitors to a web site, one could expect an increase in value that comes with these visitors. However this also depends on the value of the newly attracted visitors. Therefore the amount of web site traffic from search engines was put up against the

total added value. By now it is already clear that an increase in search engine ranking results in additional web site traffic. It is also given that these additional visitors have less value per visitor, as was already stated in the previous paragraph. This means that for the total added value of a web site to raise the traffic growth should at least overcompensate the loss in value per visitor. This research has shown that the increase in traffic from search engines amply compensates the decrease in value per visitor. This contributes to an increasing total added value for a web site when its search engine ranking is enhanced.

5.7 Conclusion

Search engine marketing can contribute remarkably to a web site's search engine visibility, which in turn can bring great value to a web site. The different methods of search engine marketing all have their own pros and cons. Search engine advertising has the benefits of speed and flexibility. An advertising campaign can be set up almost instantly and changes for a campaign are effective right away. However costs are associated with every single visitor that enters the web site through pay-per-click search engine advertising. On the other hand there is search engine optimization, which has the drawback being time consuming. It takes time to optimize a web site for search engines, acquire the required relevant backlinks and get these changes indexed by the search engine. Search engine optimization will not happen overnight, but opposite to search engine advertising in the end the visitors from organic search engine results are free. Within search engine optimization there are three main components. The text component and link component are part of the on-site process, these changes happen on the web site itself. The popularity component refers to the amount of external web sites that link to the web site that is being optimized, this aspect therefore is an off-site process. This popularity component is by far the most important aspect in search engine optimization.

By increasing search engine visibility the chance that a web site is visited is enhanced, hence SEM increases web site traffic. In order for search engine marketing to be profitable the increasing traffic should also result in increasing value for the web site. It is widely argued that higher search engine ranking attract more targeted traffic. Thurow (2007) states that visitors from search engines are automatically more relevant visitors as they are actively searching for a product or service, however it must also be noted that an increase in search engine ranking may also lead to an increase in less relevant users. This could be explained by an increasing amount of accidental or explorative visitors among these additional visitors. This means that even though the amount of visitors coming from search engines rises, the individual visitors seem to be of a lesser value. This in turn dampens the increase of the total amount of added value. Nonetheless this research has shown that even though the decreasing value per visitor can dampen the growth of the total added value, the increase in web site traffic that is accompanied with increasing search engine rankings does overtake this is. Hence increasing search engine visibility has a positive effect on both the amount of visitors from search engines as well as the total value of these visitors.

5.8 Implications for existing theory

In this research three proposition based on existing theory were tested. The two theories stating that increasing search engine rankings result in more traffic and increasing added value were both confirmed to be correct. However theories which state that search engine visitors are automatically more relevant and more likely to convert into value for the website need to be reconsidered. Although increasing traffic from search engines does add incremental value to a web site, it must be noted that the average value per visitor decreases when search engine rank increases. A higher search engine ranking seems to result not only in more targeted traffic, but also happens to bring more bulk traffic along. Therefore any theory mentioning an increase in relevant traffic resulting from increasing rankings might as well incorporate that the average value per visitor decreases.

5.9 Limitations and further research

The results of this research are based on and limited to only two test cases in the Dutch market. This research is by no means intended to give a statistical analysis for the entire market of search engine marketing. In fact it would be interesting to see if similar results were to be found when more cases are to be added. Also it might be interesting to see whether similar analysis of added value can be made in international markets or for specific branches.

It also must be noticed that this research has focused on transactional value primarily. As there are also other methods for determining and measuring value it might be enlightening to see what impact search engine ranking has on value indicators like average time spending, bounce rates and the number of pages per visit. This might as well broaden the scope of this research towards informational web sites as well. With any luck this research has been an inspiration for other researchers to create a body of scientific knowledge in this area of online marketing.

References

Animesh, A., Ramachandran, V., Viswanathan, S. (2007), An Empirical Investigation of the Performance of Online Sponsored Search Markets, ACM, New York.

Brin, S., Page, L. (1998), The Anatomy of a Large-scale Hypertextual Search Engine, Computer Networks and ISDN Systems, Stanford.

Chaffey, D., Ellis-Chadwick, F., Johnston, K., Mayer, R. (2006), Internet Marketing, Prentice Hall, London.

Fain, D.C., Pedersen, J.O. (2005), Sponsored Search: a Brief History, Bulletin of the American Society for Information Science and Technology.

Gisbergen, M.S. van, Most, J. van der, Aelen, P. (2006), Visual attention to Online Search Engine Results (available at http://www.checkit.nl/onderzoek_eyetracking.aspx).

Granka, L., Joachims, T., Gay, G. (2004), Eye-Tracking Analysis of User Behavior in WWW Search, South Yorkshire.

Hayward, N., Rogers, M. (2005), Search is brand, Weboptimiser and Market Sentinel Ltd., London (available at http://www.weboptimiser.com/resources/Searchisbrand280605.pdf).

Jansen, B.J. (2005), Paid Search as an Information Seeking Paradigm, Bulletin of the American Society for Information Science and Technology.

Jansen, B.J., Resnick, M. (2006), An examination of searcher's perceptions of nonsponsored and sponsored links during ecommerce Web searching, Journal of the American Society for Information Science and Technology.

Janssen, D., Heck, E. van (2007), How Will Online Affiliate Marketing Networks Impact Search Engine Rankings?, Erasmus Universiteit, Rotterdam.

Laffey, D. (2007), Paid search: The innovation that changed the Web, Business Horizons.

Lorigo, L., Pan, B., Hembrooke, H., Joachims, T., Granka, L., Gay, G. (2006), The influence of task and gender on search and evaluation behavior using Google, Information Processing and Management.

Page, L., Brin, S., Motwani, R., Winograd, T. (1998), The PageRank Citation Ranking: Bringing Order to the Web, Computer Science Department, Stanford University.

Pan, B., Hembrooke, H., Joachims, T., Lorigo, L., Gay, G., Granka, L. (2007), In Google we trust: Users' decisions on rank, position, and relevance, Journal of Computer-Mediated Communication, 12(3), article 3 (available at http://jcmc.indiana.edu/vol12/issue3/pan.html).

Pandey, S., Roy, S., Olston, C., Cho, J., Chakrabarti, S. (2005), Shuffling a stacked deck: the case for partially randomized ranking of search engine results.

Thurow, S. (2007), Search Engine Visibility, 2nd edition, New Riders, Berkeley.

Wall, A.M. (2007), Search Engine Optimization Book (available at http://www.seobook.com).

Weinreich, H., Obendorf, H., Herder, E., Mayer, M., (2006), Off the beaten tracks: exploring three aspects of web navigation, ACM, New York.

Yin, R.K. (2003), Case Study Research: Design and Methods, Sage Publications, London.

Zhang, J., Dimitroff, A. (2005), The Impact of Webpage Content Characteristics on Webpage Visibility in Search Engine Results (Part I), Information Processing and Management, Milwaukee.

Appendixes

Appendix A – Definitions

Affiliate marketing – A reciprocal arrangement between a company and third-party sites where traffic is directed from the third-party sites to the company web site through banners, links and incentives. In return for linking to the company site the third-party site will typically receive a proportion of any resulting sale (Chaffey 2006).

Backlink – Incoming hyperlink to a web site or web page, also known as inbound link (Wikipedia[9]).

Banner – A typically rectangular graphic displayed on a web page for purposes of brand building or driving traffic to a site. It is normally possible to click on a banner to access further information from another site (Chaffey 2006).

Click through rate – The proportion of users viewing an advertisement or listing who click on it. It is calculated as the number of clicks on the listing divided by the number of impressions (Chaffey 2006).

HTML – Hypertext Markup Language is the standard format used to define the text and layout of a web page (Chaffey 2006).

Hyperlink – A method of moving between one web site page and another, indicated to the user by text highlighted by underlining and/or a different colour. Hyperlinks can also be achieved by clicking on a graphic image such as a banner that is linked to another web site (Chaffey 2006).

Link building – The process of increasing link popularity for a web site by creating hyperlinks to a web site or stimulating other people to do so (Onetomarket[10]).

Query – The search in the index of the search engine for the keywords as entered by the end user (Thurow 2007).

Search engine spider – A program or automated script which browses the World Wide Web in a methodical, automated manner. Search engines use spidering as a means of gathering data for their index (Wikipedia[11]).

URL – Uniform Resource Locator is official the term that indicates the web address of a site. A specific domain name is typed into a web browser which will then locate and load the web site (Chaffey 2006).

[9] Wikipedia: http://en.wikipedia.org/wiki/Backlink (consulted 26-02-2008)

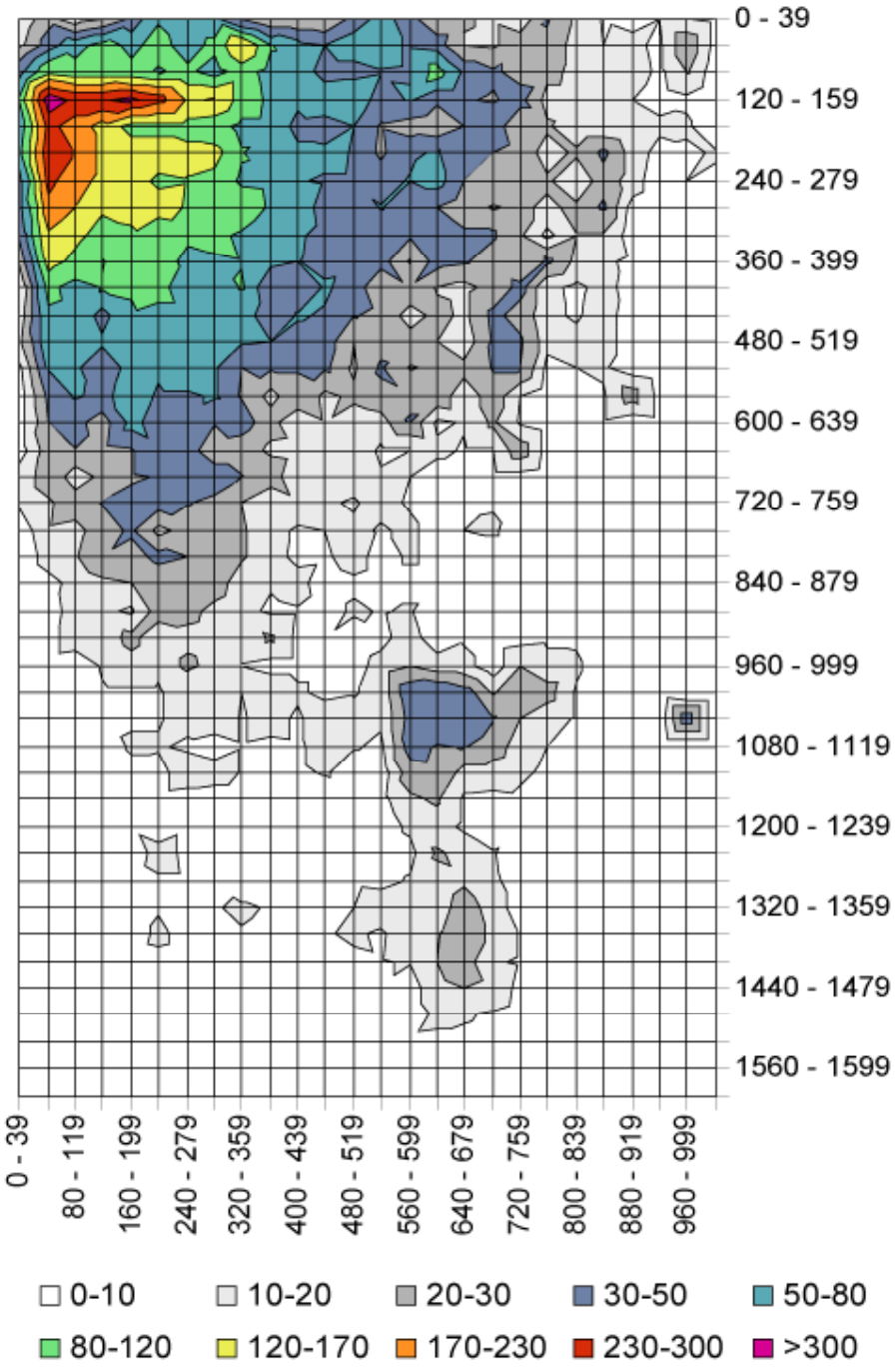
[10] Onetomarket: http://www.onetomarket.nl/online-marketing/link-building/begrippenlijst-link-building/ (consulted 16-05-2008)

[11] Wikipedia: http://en.wikipedia.org/wiki/Web_crawler (consulted 16-05-2008)

Appendix B – Keywords

Profitability
Search engine marketing
Search engine optimization
Search engine ranking
Value
Visitors

Appendix C – Link activity areas of web users



Source: Weinreich et al (2006).

Appendix D – Click through rates for top 10 search engine results

Total Searches:	9.038.794			
Total Clicks:	4.926.623			
	Clicks			
Rank 1:	2.075.765	42%		
Rank 2:	586.100	12%	= 3.5x less	-72%
Rank 3:	418.643	8%	= 4.9x less	-80%
Rank 4:	298.532	6%	= 6.9x less	-86%
Rank 5:	242.169	5%	= 8.5x less	-88%
Rank 6:	199.541	4%	= 10.4x less	-90%
Rank 7:	168.080	3%	= 12.3x less	-92%
Rank 8:	148.489	3%	= 14.0x less	-93%
Rank 9:	140.356	3%	= 14.8x less	-93%
Rank 10:	147.551	3%	= 14.1x less	-93%
Rank 1:	2.075.765	42%		
Rank 2:	586.100	12%	= 3.5x less than ^	-72%
Rank 3:	418.643	8%	= 1.4x less than ^	-29%
Rank 4:	298.532	6%	= 1.4x less than ^	-29%
Rank 5:	242.169	5%	= 1.2x less than ^	-19%
Rank 6:	199.541	4%	= 1.2x less than ^	-18%
Rank 7:	168.080	3%	= 1.2x less than ^	-16%
Rank 8:	148.489	3%	= 1.1x less than ^	-12%
Rank 9:	140.356	3%	= 1.05x less than ^	-5%
Rank 10:	147.551	3%	= 1.05x less than ^	5%

Table 3 – Absolute click through rates based on the AOL log files
Source: http://www.jimboykin.com/click-rate-for-top-10-search-results

Relation between click through rates for the top 10 search engine results

Visits in repect to:		#10	#9	#8	#7	#6	#5	#4	#3	#2	#1
#1	2.075.765	14,07	14,79	13,98	12,35	10,40	8,57	6,95	4,96	3,54	
#2	586.100	3,97	4,18	3,95	3,49	2,94	2,42	1,96	1,40		0,28
#3	418.643	2,84	2,98	2,82	2,49	2,10	1,73	1,40		0,71	0,20
#4	298.532	2,02	2,13	2,01	1,78	1,50	1,23		0,71	0,51	0,14
#5	242.169	1,64	1,73	1,63	1,44	1,21		0,81	0,58	0,41	0,12
#6	199.541	1,35	1,42	1,34	1,19		0,82	0,67	0,48	0,34	0,10
#7	168.080	1,14	1,20	1,13		0,84	0,69	0,56	0,40	0,29	0,08
#8	148.489	1,01	1,06		0,88	0,74	0,61	0,50	0,35	0,25	0,07
#9	140.356	0,95		0,95	0,84	0,70	0,58	0,47	0,34	0,24	0,07
#10	147.551		1,05	0,99	0,88	0,74	0,61	0,49	0,35	0,25	0,07

Table 4 – Relative click through rates based on the AOL log files
Source: Self deployed based on figures above.

Appendix E – Test case results on case #1

keyword 1 (sim only)

Date	*Ranking*	*Visits Google Analytics*	*Visits Clicky*	*Sales*
10-9-2007	15	19	n/a	100
17-9-2007	11	106	n/a	1051
24-9-2007	8	150	n/a	1215
1-10-2007	8	367	n/a	2244
8-10-2007	6	398	n/a	3679
15-10-2007	5	416	407	3425
22-10-2007	5	410	372	2917
29-10-2007	5	528	495	4264
5-11-2007	4	605	564	5684
12-11-2007	4	560	528	2602
19-11-2007	4	566	528	4295
26-11-2007	4	534	502	2989
3-12-2007	4	533	492	3630
10-12-2007	3	487	533	2983
17-12-2007	3	498	467	2993
24-12-2007	4	417	397	2707

keyword 2 (goedkoopste sim only)

Date	*Ranking*	*Visits Google Analytics*	*Visits Clicky*	*Sales*
10-9-2007	11	6	n/a	100
17-9-2007	10	12	n/a	377
24-9-2007	10	10	n/a	256
1-10-2007	8	7	n/a	136
8-10-2007	10	11	n/a	322
15-10-2007	10	16	17	417
22-10-2007	7	17	16	383
29-10-2007	8	12	9	307
5-11-2007	9	19	19	565
12-11-2007	10	13	13	191
19-11-2007	4	26	22	625
26-11-2007	4	39	33	691
3-12-2007	4	26	25	561
10-12-2007	4	23	27	446
17-12-2007	4	23	25	438
24-12-2007	4	40	40	822

Table 5 – test case results of SimOnline.

Appendix F – Validation of Google Analytics data

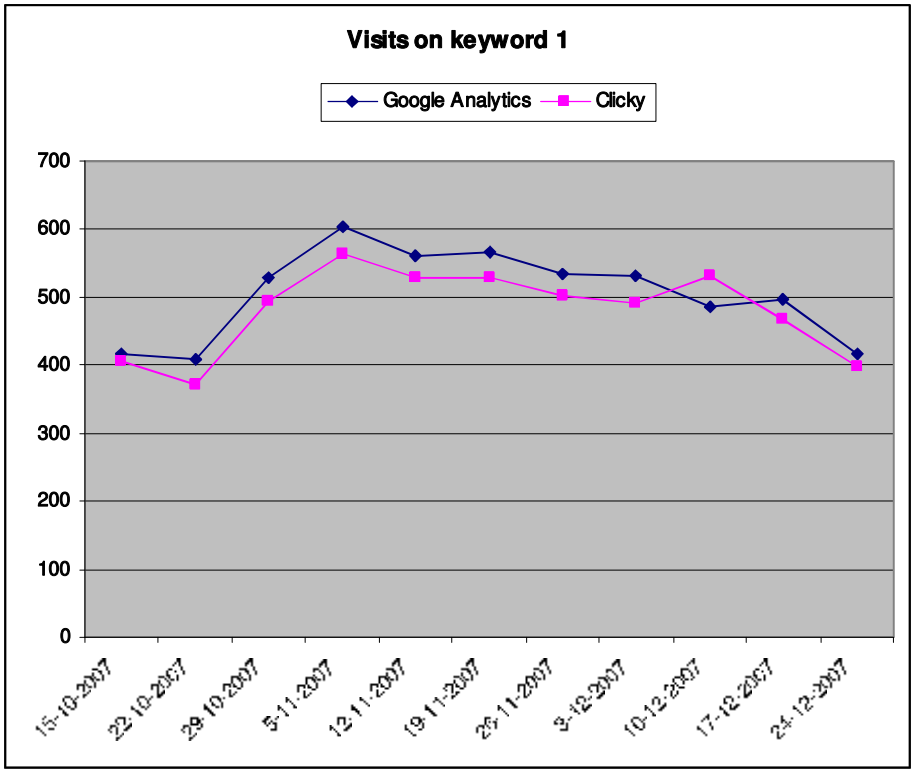


Figure 12 – Visits on keyword 1 in Google Analytics and Clicky compared

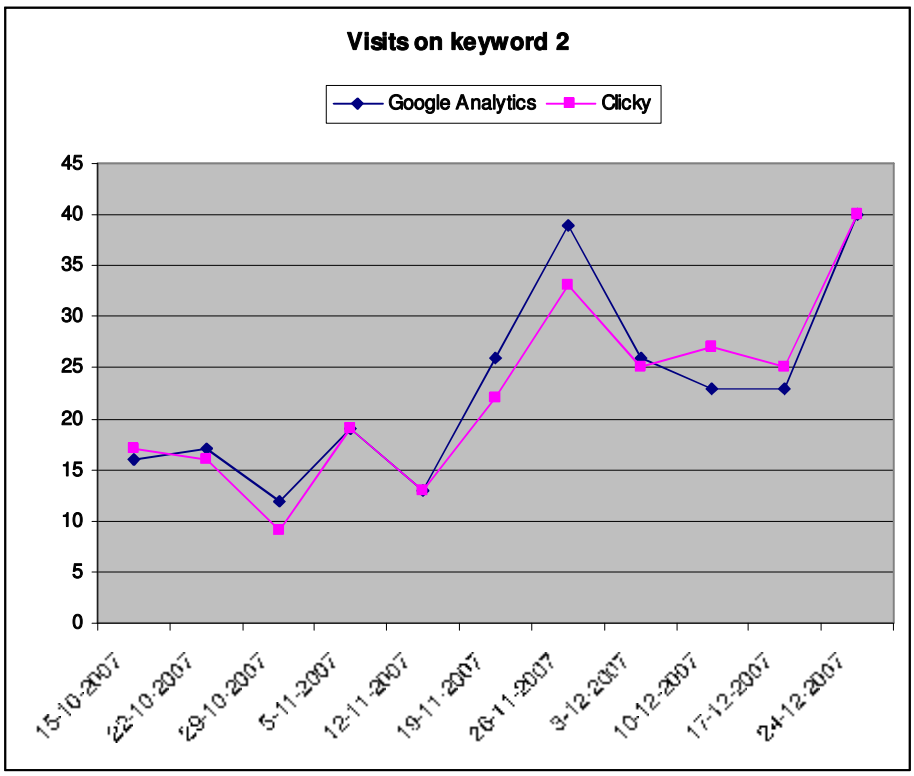


Figure 13 – Visits on keyword 2 in Google Analytics and Clicky compared

Appendix G – Test case results on case #2

Date	*Ranking*	*Visits Google Analytics*
13-8-2007	12	12
20-8-2007	10	7
27-8-2007	10	9
3-9-2007	19	40
10-9-2007	n/a	30
17-9-2007	5	35
24-9-2007	4	25
1-10-2007	4	43
8-10-2007	4	31
15-10-2007	5	36
22-10-2007	6	40
29-10-2007	4	66
5-11-2007	3	113
12-11-2007	3	67
19-11-2007	3	61
26-11-2007	4	56
3-12-2007	3	78
10-12-2007	2	87
17-12-2007	2	115
24-12-2007	1	80
31-12-2007	1	88
7-1-2008	1	146
14-1-2008	1	84
21-1-2008	1	82
28-1-2008	1	68

Table 6 – test case results of CarSafety

Appendix H – Test case results on case #2

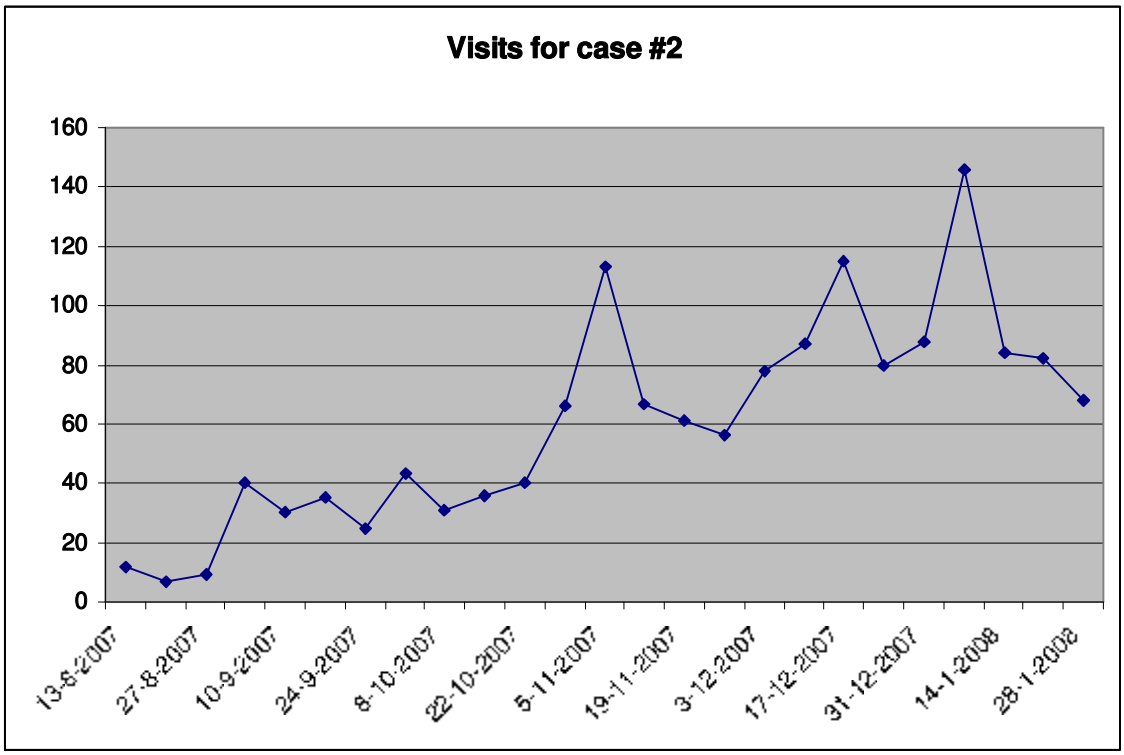


Figure 14 – Visits for case #2 (CarSafety)

Appendix I – Test case results on proposition 3

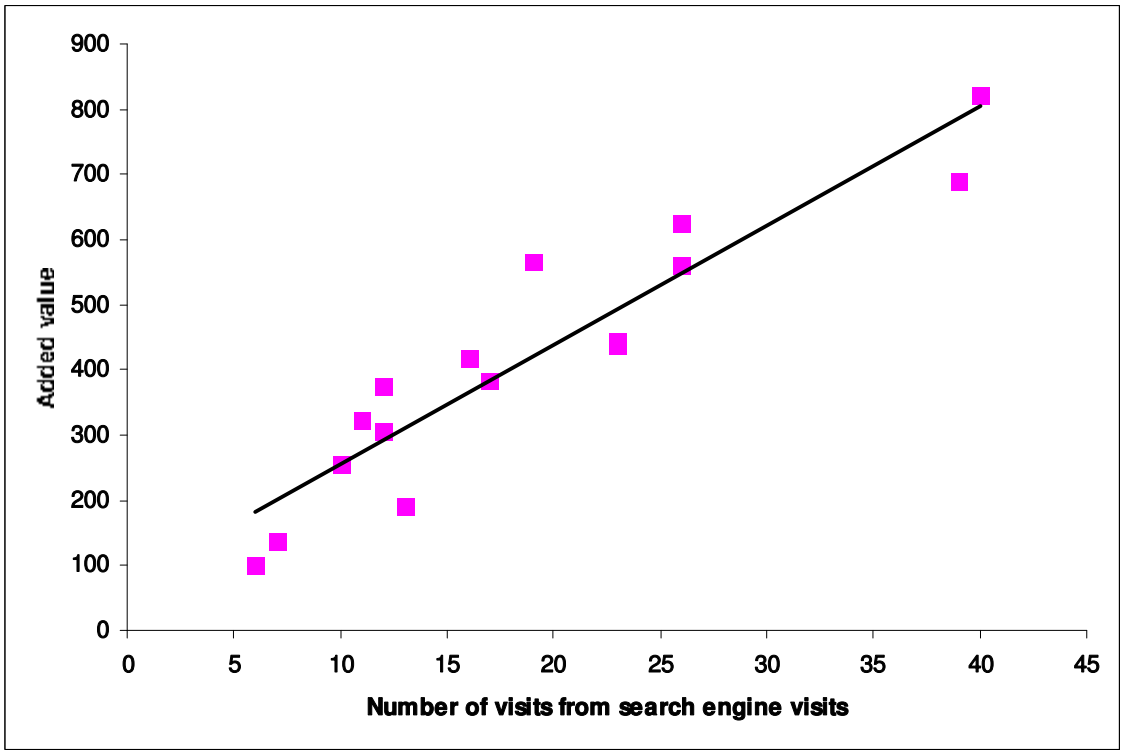


Figure 15– Added value set of against the amount of visitors from search engine for keyword 2.