

Survey on Search Engine Optimization Techniques to achieve high page rank

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Abstract

Search Engines are basically used to search for any information across internet. The first basic motive of any website or webpage is to appear at the top list of the search engine when any user searches for the related information that is in their websites content. There are various factors that affect the websites rating and plunges them to the peak list of the search crawler and some websites despite have the best content never gets into the search engines top list. This art of improving a websites visibility in the body of search engines result is known as Search Engine Optimization. . In this paper, we will compare the various algorithms that affect Search Engine Optimization process.

1. Introduction

Search Engine Optimization (SEO) aka is the art of improving a website's visibility in the main (natural/organic) body of search engine results. A seemingly complex set of factors is organized automatically by the search engines ranking algorithms. When worked through logically, step by step, these factors can be prioritized and addressed in a straight forward way.

Fundamentally there are two sides to Search Engine Optimization: **on-site optimization** and **off-site optimization**. On-site optimization focuses on factors affecting the website to do with its hosting, structure, accessibility and content. Off-site optimizations factors are all to do with links and how well integrated you are into your networks online. (Search, 2011)

In a survey it was found that majority of people expect brands at the top of search engine results to be the leading brands on that chosen search term. The diagram below shows an analysis of the way the users expect to get the information about a business.

The Proposed System “**SEO Analyzer**” is known as search engine optimization analyzer. This tool is a

web based system which is going to give us the analysis report of the website. The proposed system will help the website owner to know whether their website has all the necessary content that would make it search optimized. This tool will help the users take their business to a next level as this system will help the users know where their website is in the world and what scope of their business is if the website was search engine optimized. This software will give the summary of the website that can be used to make it more efficient.

It is important to look across the entire broad range of search terms related to our business and build a plan for getting better visibility for the search terms that do not afford us that visibility. Despite the level of competition in search engine results there is always a sweet spot to aim for – a place where we are able to achieve good visibility for search terms that still have a good number of people searching on them but aren't too competitive.

1.1 SEO Goals

The goal of SEO is to help websites or web pages achieve top placement in the organic search results by increasing the relevancy of a website or web page to the search query that users type on the search engine. Displaying the most relevant pages for the search query has many benefits to both the user and the search engine providing the results: the user finds the most relevant results for the keyword used, and the search engine is perceived as reliable and trustworthy because its algorithm displays the most relevant pages. Since SEO is concerned with improving a site's rankings on the organic or natural search results, the process requires time and knowledge of tactics to implement. Time is a huge initial investment to be made to the website or page being optimized, and an ongoing maintenance to maintain the site's top rankings. Depending on how competitive the target keyword is (or group of keywords) that will be used for optimization, SEO may take weeks or even months before seeing any results. Although the results of the SEO may not be seen immediate,

the long-term benefits of SEO can mean top rankings and a high volume of user visiting the site. Studies show that if websites want to maintain visibility and a continuous flow of visitors, they need to start paying attention on ways to achieve top rankings through effective SEO execution. But before undertaking any SEO process and start implementing specific search engine optimization methods, it's important to distinguish between on-page SEO and off-page SEO methods. The next sections explain both implementations, along with their main differences and a brief summary of the techniques within each method:

1.1.1 On-page SEO

On-page SEO deals with anything you have direct control of, in the code or content of your web site (e.g. text, headings, images, links, etc...); basically anything that you implement or upload to your site is considered on-page SEO. On-page SEO lays the foundation of all your SEO efforts because this is where you have most of the control and any updates implemented on your site can either work for you or against you on the search results. Therefore it's important to get on-page correct before launching into off-page SEO. Google uses over 200 factors to determine page relevancy and importance for deciding what pages will be displayed in the top search results; you will see that many of these factors are in direct control of the SEO engineer. The following list shows important factors that will be the focus of the on-page SEO strategies implemented:

- Keyword research
- Title tag
- Description meta tag
- Robots.txt
- Optimized URLs
- Content
- HTML headings
- Images
- Correct use of the "rel=nofollow" attribute
- Keyword placement
- Sitemap

1.1.2 Off-page

SEO As opposed to on-page SEO which gets implemented on the website with a high direct control, off-page SEO consists of all promotion that takes place outside of your website; it can be considered as the combination of all the things that can help your site get higher rankings. It's primarily focused on acquiring backlinks (links pointing to your site from other websites) from authority sites in a gradual manner, and any technique that accomplishes this goal is by definition a candidate off-page SEO technique.

1.1.3 White-hat SEO

In SEO terminology, white-hat SEO refers to the set of techniques, methods or strategies that follows search engine rules and guidelines. These are not meant to deceive or manipulate the search engine or

users in any way. It has also been called ethical SEO because it is implemented with a long-term in mind, by following correct guidelines and policies, your site will continue to appear in the search engine results and possibly top rankings.

1.1.4 Black-hat SEO

On the other hand, the term black-hat SEO refers to those set of techniques which are meant to deceive, game or manipulate the search engine's algorithm with the intention to gain high rankings. It's important to understand that these unethical methods are not approved by the search engines, and implementing any of them runs the risk of your site getting removed from the search engine's database index altogether. Performing black-hat SEO tactics can result in sudden rise in the organic listings, but it may be a matter of time before the search engines determine the existence of shady tactics, which can result in the site can getting penalized and be removed entirely from the search database index. Following are some of the most popular and more common black-hat SEO techniques:

- Hidden text or links: text or links that are the same color as the background.
- Keyword stuffing: One of the earliest forms of search engine spam, this is when the spammer uses the target keyword in large instances all over the page with the hopes that the search engine finds it relevant.
- Doorway pages: These are low quality pages that offer no value to the users. They are created with the sole purpose of ranking for specified keywords; once the visitor arrives at the doorway page, he or she is taken to the homepage or other pages where products or services can be promoted.
- Cloaking: This refers to the practice of presenting a page to the search engines and a different page to the users. The purpose of cloaking is to deceive the search engines into displaying a page that it would not otherwise be displayed.
- Link farms: The intention of link farms is to create as many sites as possible, all of them linking to your site. The idea is to inflate the number of backlinks going to the spammy site in order to deceive the search engine by into thinking it's an authority site. Google has stated that its "aim is to give users the most valuable and relevant search results."

1.2 How google ranks pages?

Search engines use their own proprietary algorithm to rank web pages to be displayed in the search results page. Search engine companies will never reveal the exact mathematical formula or algorithm that powers their search engine because it is one of their most guarded secrets. This is what Google has said about their ranking algorithm: "Traditional search engines rely heavily on how often a word appears on a Web page. Google uses PageRank to

examine the entire link structure of the Web and determine which pages are most important. It then conducts hypertext-matching analysis to determine which pages are relevant to the specific search being conducted. By combining overall importance and query-specific relevance, Google is able to put the most relevant and reliable results first.” As you can see from the previous quote, Google does not place great emphasis on how many times the keyword being searched appears on the web page, just like other traditional search engines, instead it uses its proprietary ranking algorithm PageRank to examine the link structure of the page to determine the relevancy and importance of web pages. The next section will cover PageRank in more detail.

1.3 Pre Existing Algorithms:

1.3.1 Google Penguin

Google Penguin is a codename for a Google algorithm update that was first announced on April 24, 2012. The update is aimed at decreasing search engine rankings of websites that violate Google’s Webmaster Guidelines by using now declared black-hat SEO techniques involved in increasing artificially the ranking of a webpage by manipulating the number of links pointing to the page. Such tactics are commonly described as link schemes. According to Google’s John Mueller, Google has announced all updates to the Penguin filter to the public.

1.3.2 Google Panda

Google Panda is a change to Google’s search results ranking algorithm that was first released in February 2011. The change aimed to lower the rank of "low-quality sites" or "thin sites", and return higher-quality sites near the top of the search results. CNET reported a surge in the rankings of news websites and social networking sites, and a drop in rankings for sites containing large amounts of advertising. This change reportedly affected the rankings of almost 12 percent of all search results. Soon after the Panda rollout, many websites, including Google’s webmaster forum, became filled with complaints of scrapers/copyright infringers getting better rankings than sites with original content. At one point, Google publicly asked for data points to help detect scrapers better. Google’s Panda has received several updates since the original rollout in February 2011, and the effect went global in April 2011. To help affected publishers, Google provided an advisory on its blog, thus giving some direction for self-evaluation of a website’s quality. Google has provided a list of 23 bullet points on its blog answering the question of "What counts as a high-quality site?" that is supposed to help webmasters "step into Google’s mindset". (<https://en.wikipedia.org>)

1.3.3 HummingBird Algorithm

The Hummingbird is an entirely new algorithm. It approaches search engine queries in a brand new and intelligent way utilizing new technology combined with older features of the existing algorithms. It is named for the speed and accuracy of the tiny bird.

1.4 Detailed study of HummingBird Algorithm

1.4.1 Introduction:

The Hummingbird is an entirely new algorithm. It approaches search engine queries in a brand new and intelligent way utilizing new technology combined with older features of the existing algorithms. It is named for the speed and accuracy of the tiny bird.

Everything that worked before Hummingbird’s release will still work moving forward. This includes:

Original and engaging content is still king
Legitimate back links that are earned using proper SEO are still important

The same signals that worked before will continue to garner results

Keywords will still need to be carefully placed and used in moderation

The only thing that is really going to change in a meaningful enough way to be noticeable is the way Google’s new algorithm interprets the way we search.

1.4.2 Why did Google Create Hummingbird?

Here are the reasons why Google had to create Hummingbird, and why it now has to perfect it:

- Google promised answers by creating its very first search engine. The problem is, people are asking questions, not typing in keywords.
- More and more people are using their mobile devices to search. Google knows how important it is to understand a question, especially when you are driving. Comprehension is not new. It is just refined.

1.4.3 Advantage:

There has been a great deal of worry since the release of Hummingbird. If keywords matter less, long tailed keywords matter more, the ability to answer search engine queries through content matters most, and links are still extremely effective, what can businesses on a tight SEO budget do to increase their exposure? When in doubt, content is always the answer.

Hummingbird is an Invitation to Opportunity – What matters most is giving search engines more opportunities to find you. This means broadening

your horizons by expanding the number of entrance pages that answer the questions being posed in your niche. More entrance pages with original content will accomplish several goals that can help with Hummingbird on the prowl:

- More pages that are original offer more opportunities to answer search engine queries
- A wider topic coverage area for your expertise
- The opportunity to introduce more long tail keywords
- Surfing the news websites for your niche and writing creative content from current stories
- Videos are still hot and alluring for those choosing links with answers to their questions
- Infographics draw the curious and are a great way to answer search engine queries in a creative and attractive manner

The Hummingbird Algorithm Opens Doors – In essence, nothing changes unless you have not been doing the things that you should be doing to be noticed. Creativity is what is needed if your business wants to compete in an incredibly competitive keyword market. Original content needs to be produced as often as possible.

If your business is to grow, the website and its corresponding blog needs to grow. The same thing that worked before, should still work with Hummingbird, especially if the content contains the answers to current topics from which questions may arise. All of these things still work:

Surfing the news websites for your niche and writing creative content from current stories

Videos are still hot and alluring for those choosing links with answers to their questions

Infographics draw the curious and are a great way to answer search engine queries in a creative and attractive manner

Hummingbird and the Opportunity for More Exposure – When you really think about it, the release of Hummingbird creates the perfect scenario for smaller websites to gain more exposure. The incentive to create more entrance pages and be as creative and daring as larger sites should bring about a new prosperity.

Since branded keyword traffic data has been eliminated through Secure Search and Hummingbird now “gets” search engine queries, the ability to broaden website, blog content, and entrance pages in order to answer more questions is now a vital part of SEO strategy. The Hummingbird’s presence should just be an afterthought.

1.4.4 Hummingbird Do’s and Don’t’s

One of the mistakes that some webmasters have made already is to hit the panic button and attack their existing content. There is really no need to go through your entire site making changes to content or anchor text to reflect a “How To...” overhaul in order to attract Hummingbird’s attention. The only thing that this can lead to is disaster.

If you have good, original content, revamping it may only make matters worse. You open the door to mistakes and may only ruin perfectly good content. The best thing to do is balance your content moving forward, making sure to be creative while adding some “How To” articles and blog posts liberally. You can tweak your website content to a small degree; just don’t be too obvious about it.

Claim authorship if you have not done so already. If you need to ask what authorship is, you are already behind in the game and need to start doing a little bit of catch up. Here is the deal... Google loves Google. If your website and corresponding blog is not already tied to your Google+ account, it needs to be.

Tying your efforts to Google+ allows your content efforts to be seen in the work section of your plus account by everyone in your circles, which should be half of the planet’s population. Check out this link for details on how you can take control of your Google authorship.

Do not do anything that would appear to be an overt move to take advantage of any new Google rollout. Think about this for a moment: Google rolls out a new algorithm, the largest single change since 2001, and adds nothing to prevent smart and sly webmasters from taking advantage of it. That is very doubtful.

Do not do anything foolish such as suddenly hiring a link building service that uses less than desired tactics to load you up with how to links or who knows what. Google will surely have a watchdog program for that. Keep it natural and have your company message associated with good quality content. When my clients ask about the core of their marketing plan, I always end up explaining content marketing. This is what everyone should focus on. Simply ask yourself what if Google didn’t exist?

It is always a good idea to take advantage of any and all of the numerous Google services that are offered, mostly free of charge, that will help you to improve your website and blog. Video links on Google owned YouTube.com that teach or answer important questions are a perfect example of taking

advantage of Google's generosity and putting your business website squarely on Google's Hummingbird map. Interviews with experts in your niche also are a wonderful idea since they are already composed in the question and answer format. (SIU, 2014)

1.5 Google Penguin vs Panda vs Hummingbird

Search engine algorithms are based on a simple premise: searchers want an answer to their queries. For any search, there are hundreds or thousands of sites that offer a potential link or insight related to the query. As a result, search engines need to accomplish three goals:

- Disqualify all the sites that aren't relevant.
- Return a list of sites that are relevant.
- Rank and prioritize those sites in order of importance, to identify which sites are the most relevant.

Because no single factor is sufficient to provide these insights, Google and other search engines use complex algorithms that blend dozens of factors. The exact formula isn't known, but a range of topics are considered. These include:

- Link authority: number of incoming links, quality of the sites, anchor text used
- On page factors: such as title tags, responsive mobile design, page loading speed
- Brand metrics: search volume for the brand, brand mentions, citations of brand name in connection with specific keywords
- Content: quality and depth of content, frequency of new content updates, reads and shares on social media

Just when you think you've grasped the specific details of Google's algorithm, it's important to note that changes occur all the time. By understanding the historical trends in what's changed and staying on top of how things are evolving, website owners stand the best chance of developing and implementing strategies that lead to great long-term rankings. For a more in-depth look at Search Engine ranking factors, see Moz's annual Search Ranking Factors survey.

Google's Recent Key Updates

Navigating Google's current landscape requires not only a general understanding of search engine algorithms and how they operate, but specifics of recent updates. In the last few years, Google has implemented a number of changes that have hit site owners particularly hard. These have focused on three key areas: content and usability, the quality of links, and the importance of mobile and how we

search. Here's a closer look at each of these updates and what you need to know to be up to speed.

1.5.1 Google Panda

Google Panda was first introduced in February 2011, and has had several smaller updates rolled out since that. Panda started the ball rolling on the content discussion, focusing on eliminating low-quality or thin sites in favor of those with in-depth, regularly updated content. Panda also tackled sites with too much advertising and poor navigation, when commercial gains were clearly prioritized over user experience. Since Panda, content marketing has increased in popularity with a focus on blogging, on-site content, building off-site content assets through practices like guest blogging, and social media participation.

In July 2012, Google provided a series of questions to help webmasters evaluate whether their sites were in line with the search engine's quality guidelines. Reviewing these questions provides the best sense of the types of issues Panda addresses, and the types of violations that are likely to get sites into trouble. The questions included:

- Would you trust the information presented in this article?
- Is this article written by an expert or enthusiast who knows the topic well, or is it more shallow in nature?
- Does the site have duplicate, overlapping, or redundant articles on the same or similar topics with slightly different keyword variations?
- Would you be comfortable giving your credit card information to this site?
- Does this article have spelling, stylistic, or factual errors?
- Are the topics driven by genuine interests of readers of the site, or does the site generate content by attempting to guess what might rank well in search engines?
- Does the article provide original content or information, original reporting, original research, or original analysis?
- Does the page provide substantial value when compared to other pages in search results?
- How much quality control is done on content?
- Does the article describe both sides of a story?
- Is the site a recognized authority on its topic?
- Is the content mass-produced by or outsourced to a large number of creators,

or spread across a large network of sites, so that individual pages or sites don't get as much attention or care?

- Was the article edited well, or does it appear sloppy or hastily produced?
- For a health related query, would you trust information from this site?
- Would you recognize this site as an authoritative source when mentioned by name?
- Does this article provide a complete or comprehensive description of the topic?
- Does this article contain insightful analysis or interesting information that is beyond obvious?
- Is this the sort of page you'd want to bookmark, share with a friend, or recommend?
- Does this article have an excessive amount of ads that distract from or interfere with the main content?
- Would you expect to see this article in a printed magazine, encyclopedia or book?
- Are the articles short, unsubstantial, or otherwise lacking in helpful specifics?
- Are the pages produced with great care and attention to detail vs. less attention to detail?
- Would users complain when they see pages from this site?

1.5.2 Google Penguin

Google Penguin was the search engine's response to so-called "black hat" SEO tactics for link building, which was first released in April 2012. Numerous updates have been rolled out since then. Manipulative link building techniques that focused on creating links through "link schemes" were targeted. These included buying links, building thin sites simply for the purpose of linking back to a main site, trading links, comment spam links, and similar tactics.

The era of Google Penguin has required site owners to take a much harsher view on link building. Each site, perhaps for the first time in the history of SEO, is expected to know and own its site link profile. The volume, quality, source, and content of links ultimately fall to the site's owner. If dubious practices are detected, site owners may be required to audit their entire link profile and work to have poor quality links removed. Today, when building links, it's smart to ask questions such as:

- Is this a high quality site?
- Is it relevant to my topic or niche?
- What does that site's link profile look like?

Will they use diverse anchor text to point to my site?

1.5.3 Google Hummingbird

Hummingbird reinforced everything that had been done through Google Panda and Penguin, but added two specific dimensions. Announced in late 2013, Hummingbird introduced the importance of mobile devices to search. For the first time, mobile responsive designs clearly have taken on increased importance. Many have argued that it's also critical to have a mobile content strategy: that is, to assume that readers will be accessing your content from a variety of devices including smartphones and tablets and creating your content with a mobile-first mindset.

The second, and perhaps more exciting, component of Hummingbird was the introduction of contextual search. Until Hummingbird, search engines typically interpreted queries using what it identified as the most important keywords from a search. But with Hummingbird's introduction, Google has begun to look at the relationship between terms to interpret context.

Many considered Hummingbird a natural evolution both of Google's development and of the proliferation of mobile devices. After being in business for 15 years, Google's developed an incredibly rich and sophisticated Knowledge Graph (or major database of all the information that it's collected). As more and more users search on mobile devices, searches are evolving from short keyword driven inquiries to being structured the way we naturally speak and ask questions. Hummingbird is helping to ensure that Google is poised to understand and meet that demand. (SEO-Guide)

1.6 Literature Review

G. S. Bedi, (March 2014), shows the importance of some techniques of Search Engine Optimization (SEO). He described previous work done on the subject of SEO, the early beginning of SEO, its goals and ideas such as White Hat SEO, Black Hat SEO, On page SEO, Off Page SEO, their benefits.

Dr S. Saravanakumar, (September 2012), implied a new methodology of Search Engine Optimization (SEO) without getting sandboxed by search engines like Google, Bing and other. In the past, the algorithm was based on the quantity of back links that a site has. This process involved in implementing safe link building techniques with link velocity as its key without compromising the on page optimization. The latest algorithmic updates are taken in to consideration and the strategy is developed to rank for a keyword. By implementing this method, any organization can

take advantage of the traffic from the search engines and have a good online presence. He also explained basic guidelines recommended by all the search engines for proper indexing without sandboxing. Hence even in the future; this method will not hinder the online progress of any business.

Joeran Beel, discussed the concept of academic search engine optimization (ASEO). Based on three recently conducted studies, guidelines are provided on how to optimize scholarly literature for academic search engines in general and for Google Scholar in particular. In addition, he briefly discussed the risk of researchers' illegitimately 'over - optimizing' their articles.

Rajesh Singh (September 2013) discussed that extracting information is too much costly in terms of processor time. A distributed design approach is proposed in this paper. He discussed how to design a such type of search engine architecture in which processing of a search engine may be in distributed form by which the time or processing power may be reduced.

1.7 Conclusion

Webmasters and content providers began optimizing sites for search engines in the mid-1990s, as the first search engines were cataloguing the early Web. Initially, all webmasters needed to do was to submit the address of a page, or URL, to the various engines which would send a "spider" to "crawl" that page, extract links to other pages from it, and return information found on the page to be indexed. The process involves a search engine spider downloading a page and storing it on the search engine's own server, where a second program, known as an indexer, extracts various information about the page, such as the words it contains and where these are located, as well as any weight for specific words, and all links the page contains, which are then placed into a scheduler for crawling at a later date.

Site owners started to recognize the value of having their sites highly ranked and visible in search engine results, creating an opportunity for both white hat and black hat SEO practitioners. According to industry analyst Danny Sullivan, the phrase "search engine optimization" probably came into use in 1997. On May 2, 2007 Jason Gambert attempted to trademark the term SEO by convincing the Trademark Office in Arizona that

SEO is a "process" involving manipulation of keywords, and not a "marketing service." The reviewing attorney basically bought his incoherent argument that while "SEO" can't be trademarked when it refers to a generic process of manipulated keywords, it can be a service mark for providing "marketing services...in the field of computers."

As an Internet marketing strategy, SEO considers how search engines work, what people search for, the actual search terms or keywords typed into search engines and which search engines are preferred by their targeted audience. Optimizing a website may involve editing its content, HTML and associated coding to both increase its relevance to specific keywords and to remove barriers to the indexing activities of search engines. Promoting a site to increase the number of backlinks, or inbound links, is another SEO tactic.

The research here is for a tool which is known as search engine optimization analyzer. This tool is going to give us the analysis report of the website. The proposed system will help the website owner to know whether their website has all the necessary content that would make it search optimized.

An important aspect of Search Engine Optimization is making your website easy for both users and search engine robots to understand. Although search engines have become increasingly sophisticated, in many ways they still can't see and understand a web page the same way a human does. SEO Analyzer helps the engines figure out what each page is about, and how it may be useful for users.

Somewhere between 80-90% of customers now check online reviews prior to making a purchase, and this number is only expected to increase. It won't be long before virtually everyone is searching for products and services online. Without SEO in place, people will have a very hard time finding you and the business and will instead find your competitors.

SEO Analyzer will help these pages to be more search engine optimized and hence it will be benefit for increasing the traffic on the website and hence the business will also increase.

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