

SEARCH ENGINE OPTIMIZATION

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Abstract : Search Engine Optimization is the process of affecting the visibility of a website on search engine result page. In a more generic view, the more frequently a site appears in the search results page, the more visitors it will receive from the users of search engine. The rapid growth in website development has called for webmasters to establish an effective method for optimizing contents for search engine and users. Search Engine Optimization helps enhance users experience while performing queries on search engines. This report is primarily targeted at Webmasters, Search Engine Optimization Experts and Companies, Individuals, Researchers, Educators and Organizations with an interest in improving their website visibility on Search Engines Result Page. The way Search Engine Optimization improves websites visibility are discussed. The advantage, disadvantage and the techniques deployed in Search Engine Optimization are discussed. This report has covered the types of Search Engine Optimization techniques along with various other effective factors used in it and gives an understanding about how it works in achieving great traffic to websites.

IndexTerms - Visibility, Optimization, Traffic.

I. INTRODUCTION

Search Engine is a website run by a collection of programs that returns a list of relevant search results from the world wide web according to the respective search query. The search engine's internal evaluation algorithm determines which position a website will get in the search results. Google, Bing and Yahoo are examples of popular search engines.

Working of a Search Engine

Every search engine uses different complex mathematical formulas to generate search results. Search engine algorithms take the key elements of a web page, including the page title, content and keyword density, and come up with a ranking for every result. Different rankings are given to the results by different search engines for the same search query according to the base algorithm. To preserve the search criteria the algorithms keep undergoing modification and revision. This means that the criteria to best optimize a site with must be surmised through observation, as well as trial and error – and not just once, but continuously.

Search Engine perform several activities in order to deliver search results.

- **Crawling:** Process of fetching all the web pages linked to a website. This task is performed by a software called a Crawler or a Spider (or Googlebot, as in case of Google).
- **Indexing:** Process of creating index for all the fetched web pages and keeping them into a giant database from where it can later be retrieved. Essentially, the process of indexing is identifying the words and expressions that best describe the page and assigning the page to keywords [1].
- **Processing:** When a search request comes, the search engine processes it, i.e., it compares the search string in the search request with the indexed pages in the database.
- **Calculating Relevancy:** It is likely that more than one page contains the search string, so the search engine starts calculating the relevancy of each of the pages in its index to the search string.
- **Retrieving Results:** The last step in search engine activities is retrieving the best matched results. Basically, it is nothing more than simply displaying them in the browser. Search engines such as Google and Yahoo! Often update their relevancy algorithm dozens of times per month. When you see changes in your rankings, it is due to an algorithmic shift or something else beyond your control. Although the basic principle of operation of all search engines is the same, the minor difference between their relevancy algorithms lead to major changes in the relevancy of results [2].

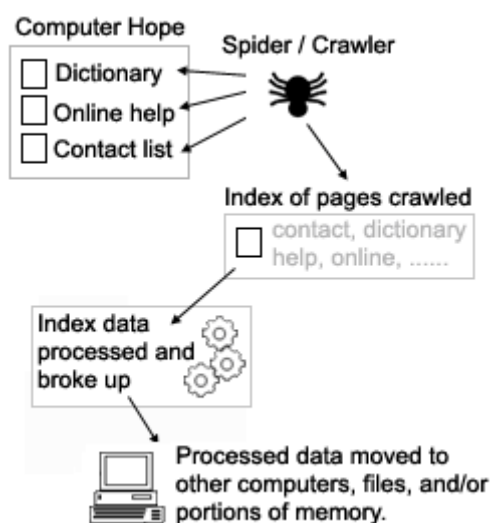


Fig: Working of a search engine [3].

Different Types of search engines:**crawler**

All [crawler](#) based search engines use a crawler or bot or spider for crawling and indexing new content to the search database. The crawler digs through individual web pages, pulls out keywords and then adds the pages to the search engine's database. [Google](#) and [Yahoo](#) are examples of crawler search engines [4].

Advantage:

- They contain a huge number of pages.
- Ease of use.
- Familiarity.

Disadvantages:

- Sometimes, it's just too much information.
- It is easy to trick the crawler. Websites have hidden data that can be manipulated to make the page appear like it's something it's not.
- Page rank can be manipulated. While search engine companies frown on the practice, there are ways to improve where your page appears on the list of results [4].

Directories

Directories are human powered search engines. A website is submitted to the directory and must be approved for inclusion by editorial staff. [Open Directory Project](#) and [the Internet Public Library](#) are examples of directories [5].

Advantages:

- Each page is reviewed for relevance and content before being included.
- Less results sometimes means finding what you need quicker.

Disadvantages:

- Unfamiliar design and format.
- Delay in creation of a website and it's inclusion in the directory.
- May have trouble with more obscure searches.

Hybrids

Hybrids are a mix of crawlers and directories. Sometimes, you have a choice when you search whether to search the Web or a directory. Other times, you may receive both human powered results and crawler results for the same search. In this case, the human results are usually listed first [6].

Meta

Meta search engines are ones that search several other search engines at once and combines the results into one list. While you get more results with meta search engines, the relevancy and quality of the results may sometimes suffer. [Dogpile](#) and [Clusty](#) are examples of meta search engines [7].

Advantages

1. You can search several search engines at one time.
2. Search across a number of engines using a single interface
3. Ranking according to subject
4. can save time searching
5. More of the web searched
6. Duplicates removed

Disadvantages

1. You may retrieve inappropriate websites depending on how each individual search engine interprets the search.
2. Difficult to limit searches
3. search engine coverage

Search Engine Optimization also referred as SEO. SEO is a technique for:

- Designing and developing a website to rank well in search engine results.
- Improving the volume and quality of traffic to a website from search engines.
- Marketing by understanding how search algorithms work, and what human visitors might search.

SEO is a subset of Search Engine Marketing. SEO is also referred as SEO copywriting, because most of the techniques that are used to promote sites in search engines, deal with text. About 80% of internet user sessions begin at the search engines. About 55% of online purchases are made on sites found through search engine listings.

II. LITERATURE SURVEY

This research paper highlights the two key points the 'key concepts' 'key lessons' to increase the website visibility using Search Engine Optimization Techniques [8]. Web search engines use algorithms to rank the results according to relevancy of query to return the best results on top search list. How a search engine decides which pages are best for given query and in what order result should be shown is differs widely from one search engine to another. Web search provide instant access to millions of search results, but at the same time quality of the information linked by these search results is rough. Some of this information may be incorrect or come from unreliable sources. Experts at search engine companies are working continuously to fine-tune their algorithms and build systems to return the most authoritative and relevant pages. Today, many search engines available on the Internet, such as Google, Yahoo, Bing, AltaVista, MSN Search, Ask and many more. Each search engines have different features and efficiencies. Researchers perform the studies to decide which search engine is most capable of retrieving relevant

information. In fact, several comparative studies report limitations in search engine's performances. Lot of research has been done to measure ranking relevancy among results of major search engines [2].

III. PROBLEM STATEMENT

Users use search engines for most of their queries but they only prefer the results available on first page and 2-3% of users go on further pages (except researchers), Now imagine if the page of an organisation is on 2nd, 3rd or 4th page then the business which can be generated from that page has a very less chance to return and user will prefer the page coming on the 1st page. Trillions of webpages are indexed per day in a search engine. There are millions of searches per day. Most of the visitor's visit the website by hitting the links available in search engines and believe that companies found on the top results are the best brand in their product service and category. These clues make it very clear that if an organization wants to go on top in their sales then they should concentrate in getting their page widely available in the search engines. And so, SEO is a must.

IV. DESIGN AND METHODOLOGY

Search Engine Optimization Techniques: As an advertising technique to build a site's positioning, SEO considers user interests. After referring to the methods adopted by previous relevant studies, SEO techniques are observed from four aspects: structure optimization, keywords optimization, content optimization and link optimization [2]. Along with four mentioned aspects, we choose some other factors which are very crucial for online business.

The following are the deployable techniques that can help put your website on the top of search engines:

Commit yourself to SEO Process: SEO is never a one-time event. Search engine algorithms change regularly hence, what seems to be working some years back might not work this year especially due to Black Hat SEO activities.

Get web analytics in place at the start of your SEO campaign: There is certainly many web analytics on the web to keep track of your SEO. A good example is the Google Analytics. It is strongly recommended.

Build a great website: Do not misunderstand "great website", a great website does not mean it should be built with flash and frames but a site that is simple to navigate and easy to understand. Such is a great website. More importantly, you should always check Google's webmaster's guidelines for some useful tips in the developing a great website.

Do keyword research at the start of the project: You should be realistic to target keywords that have less competition. Tools like Google Keyword planner would of greater value in analysing competition statistics and as well evaluate your chances of ranking #1 position on search engine result page (SERP). Ubbersuggest.com is another tool for suggesting keywords, get hold of it.

Use a unique and relevant title, content and Meta description: It is important to show off your uniqueness to search engines by creating unique contents. Unique contents and better description tag (META-TAG) will in the long run increase your domain authority. Avoid copied contents and poor Meta description. Remember that Meta tag in most cases acts as a SNIPPET on SERP. Also, remember the sayings "CONTENT IS KING". If you have a great content, chances are that users keep on coming for more content on your website. Consider your users first before Search Engine: You really need to consider writing contents for your readers/customers before considering the search Engines. Avoid keyword stuffing rather get your articles optimized for your target keyword. Use your keywords as anchor text when linking internally: Although some SEO experts criticize this technique; I will recommend you still use this technique but not in excess though. Some experts say it leads to KEYWORD CANIBALIZATION.

Build links intelligently: Be it an external link or internal link, you should not build links as if you were a link-bot rather be slow and steady. Do not go around the web populating links back to your domain in a way that looks mischievous. Additionally, be careful to disallow links from poor domains pointing to yours and you should as well not submit your site to poor directories (Link Farms).

4.2.1 Search Engine Rank

When you search any keyword using a search engine, it displays thousands of results found in its database. A page ranking is measured by the position of the web pages displayed in the search engine results. If a Search Engine is putting your web page on the first position, then your web page rank will be number one and it will be assumed as the page with the highest rank [9].

SEO is the process of designing and developing a website to attain a high rank in search engine results. Ways of Optimization There are two ways of optimization:

1. On-Page SEO: It includes providing good content, good keywords selection, putting keywords on correct places, giving appropriate title to every page, etc. Elements: Title tags, Meta tags, ALT tags, Anchor tag, Usability, Content, Keyword density, Internal linking, Relevant Keywords, Header tags [10].

2. Off-Page SEO: It includes link building, increasing link popularity by submitting open directories, search engines, link exchange, etc [10].

4.2.2 Black Hat SEO

An SEO tactic is considered as Black Hat or Spamdexing if it has the following features:

- Attempting ranking improvements that are disapproved by the search engines and/or involve deception.
- Redirecting users to a page that is built for search engines to one that is more human friendly.
- Redirecting users to a page that was different from the page the search engine ranked.

- Serving one version of a page to search engine spiders/bots and another version to human visitors. This is called Cloaking SEO tactic.
- Using hidden and invisible text or with the page background colour, using a tiny font size or hiding them within the HTML code such as “no frame” sections.
- Repeating keywords in the Meta tags, and using keywords that are unrelated to the website content. This is called Meta tag stuffing [6].
- Calculated placement of keywords within a page to raise the keyword count, variety, and density of page. This is called Keyword stuffing.
- Creating low-quality web pages that contain very little content but are instead stuffed with very similar keywords and phrases. These pages are called Doorway or Gateway Pages.
- Mirror websites by hosting multiple websites – all with conceptually similar content but using different URLs.
- Creating a rogue copy of a popular website which shows contents similar to the original to a web crawler but redirects web surfers to unrelated or malicious websites. This is called Page hi-jacking [11].

4.2.3 White Hat SEO

White Hat is the clean and effective method of achieving high rankings and traffic to websites. Basically, an SEO tactic is considered as White Hat if it has the following features:

- It conforms to the search engine's guidelines.
- It does not involve any deception.
- It ensures that the content a search engine indexes, and subsequently ranks, is the same content a user will see.
- It ensures that a web page content should have been created for the users and not just for the search engines.
- It ensures good quality of the web pages.
- It ensures availability of useful content on the web pages. Always follow a White Hat SEO tactic and do not try to fool your site visitors. Be honest and you will definitely get something more [11].



Fig: SEO Techniques

4.2.4 SEO building blocks

1. Keywords: - A keyword is a term that is used to match with the query a person enters into a search engine to find specific information. - Most people search phrases that consists of two or five words, such phrases may be called search phrases, keyword phrases, query phrases, or just keywords. - Good keywords phrases are specific and descriptive. - Keywords are words that appear the most in a page.
2. Title tags: - The title tag is important in optimizing rankings. - This is the first thing that a search engine displays on a search result. - The keywords must be in title to be ranked no. 1. - It should have the exact keyword you use for the page. Every single web page must have its own title tag. You can use up to 65 characters [11].
3. Meta description tags: - It is displayed below the title in search results. It uses dynamic, promotional language, keywords.
4. Meta keywords tags: - It no longer carry weight with major Search Engines. - It is a myth that Meta keywords alone affect rankings [12].

4.2.5 Influence of Big Data

Big Data provides essential information to marketers.

When you think of traditionally essential factors related to SEO, you probably think of things like keywords, backlinks, page optimization, [PPC management services](#) and the like. These insights provide critical data that marketers can use to determine the best ways to approach their target audiences [13].

Custom analytics tools can dig deeper into Big Data than ever before.

As great as all this data is, it doesn't help a bit if there's no increase in conversions. Thankfully, tools like [Google Analytics](#) and Bing Webmaster Tools are able to dive deep into metrics like page views, bounce rate, and traffic, drawing correlations that allow you to determine what works, what doesn't, and where you lose people during a marketing campaign [13].

V. CONCLUSION AND FUTURE SCOPE

There are many factors that must be taken care of to build a proper optimization technique. Every word used in the website will influence the website rank. From back links to anchor tags build the relevancy of the site. We now can understand how crucial it is to optimize keywords, title, meta tags, anchors and all the other text from the viewpoint of SEO. In a nutshell, we can have the following points as the ethical strategies for achieving optimal ranking in the search engines: All pages must conform to W3C standards, keywords density is never abusive, keywords are prominent in the Title, Meta tags, and Headings, ALT tags and title tags are not forgotten, nomenclature is fundamental to being indexed. As a future work we can develop tools which can add the site to a search engine whenever user wants and can remove the sites which are not good. We would try to have the page rank of the site being improved. It would be a great task to have the site listed immediately after the paidSEO sites.

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