

# Search Engine Optimization Techniques and Tools

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## ABSTRACT

Basically, the search engine is used to search for any information on the Internet. The purpose of any website or webpage is to appear on top of the search engine when any user searches for relevant information in the content on their website. There are several factors that affect website ratings and make it down in the search crawler's crop list and some websites do not even come in the top search engine list despite the best content. The art of improving website visibility is known as search engine optimization. Most of times, main focus is set on making the website as user-friendly as possible, stable, fast and secure. But when creating the website, we need to take into consideration an essential factor, which is making the world aware of their website and their content. In this paper, we will survey how various techniques optimize the search result in search engine.

**Keywords :** Search Engine Optimization (SEO), Optimization techniques, Algorithm, Crawler, Search Engine

## I. INTRODUCTION

Search engine is an application used to help find information on the Internet. A search engine is usually accessed through a page on a website that lets users search the content of billions of websites across the web by entering a set of keywords into the search textbox. The user-submitted keywords will then be matched against cached or indexed pages in the search engine's database, and the list of references that match the keywords or the keyword criteria will be returned. Search engines index new web pages and update existing ones regularly to provide faster and more efficient search.

The search engine is not only used to search text content. They can be used to find images, videos, applications, books and more. In addition, some search engines, such as Google, which today are leading the search, allow filtering by search time, country and city.

Search Engine Optimization (SEO) is the process of refining a website's design and making it visible in search engines, improving its ranking and increasing the number of visitors. There are many different ways to apply SEO for a website, from the keywords on the webpage to the way other websites link to the site.

## II. METHODS AND TECHNIQUES

### Search Engine Optimization Techniques:

It is the way of increasing the visibility of a page by natural means i.e., unpaid search results. In this process the website undergoes redevelopment to make our keywords effectively communicate with major search engines. This work is done by SEO (Search engine optimizers), They may target image search, academic search, local search, video search. Optimizing a page involves editing contents & HTML codes in order to increase its relevance to specific keywords and proper indexing in search engines .The contents and coding are edited keeping in view of the

indexing pattern of the search engines which are done by a crawler named Googlebot in Google. It is the most powerful way to reach to reach the customer as we meet them when they are in need. Most of the users find the target websites during their search.

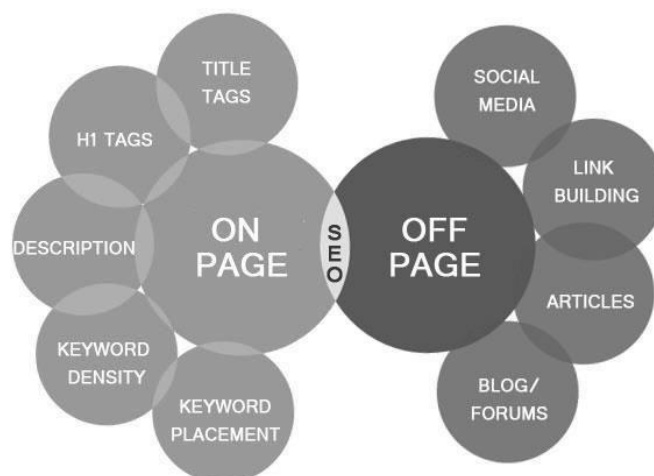
**Crawlers & Database:** It is a computer programme which browses the World Wide Web in a methodical, automated manner or in a orderly fashion. It normally visits the URL'S of our website [4]. Google Googlebot MSN MSNbot Yahoo Yahoo Slurp.

**On page optimisation:** It is the first step which every webmaster should concentrate, this deals with the changes we do in our page in order to improve visibility and rank. On Page Optimisation is optimising your website in a way that it can rank better in search engines and improve visitor satisfaction. This optimisation technique depends on nature and business of our website. It is advisable to update the contents of our website and optimise the content each time as these factors are directly related to the content and structure of the website. Modifying Title, Body text, Hyperlinks, URL, Quality and easy to understand contents, increasing the frequency of keyword, robots.txt, sitemaps, Image optimization etc which requires extensive research with the competitor webpages.If proper Onpageoptimisation is done, results in drastic increase in the rank and readability of the website[5].

**Off page optimisation:** This is the work which is done apart from the website to improve the visibility & ranking of a page. Off page search engine optimization is supposedly the complement of On Page Optimization It mainly concentrates in creating backlinks & social media marketing. It is very novel practice to have links from a webpage which has good rank and visibility. It is the best technique to go ahead of the competitors if the webmaster team is equipped with quality of web researchers. In brief it consists of various link building methods like Blog posting, Social

networking, Press release, Video submission, link exchange, Article submission etc [6].

**Search engine Anatomy** There are four parts in a search engine is observed when a query is done, we may call them as the part of search results. The engine also indicates how many results it has fetched and in how much duration. 2.6.1 Non sponsored listing These are the results from the listings that are done by Google crawlers according to their ranking algorithm. For these listing we need not to pay anything to Google, The pages are ranked according their quality. 2.6.2 Sponsored Listing These results are also shown in the result page at the top most and the right corner, for these listing we need to pay to Google. 2.6.3 Search box This portion is used by the user for his query; it may be from his country or from World Wide Web. 2.6.4 Google instant As we start typing out our query in Google, it starts displaying our result analysing each word. This feature depends on the speed of connection, many a times it doesn't work on slow connection.



**Fig 1 : On-Off page Optimization**

### III. TOOLS Used

**Google webmaster tool** Google Webmaster Tools is a no-charge web service by Google for webmasters. It allows webmasters to check indexing status and optimize visibility of their websites. It has tools that let the webmasters:

- 1) Submit and check a sitemap
- 2) Check and set the crawl rate, and view statistics about how Googlebot accesses a particular site
- 3) Generate and check a robots.txt file. It also helps to discover pages that are blocked in robots.txt by chance.
- 4) List internal and external pages that link to the site
- 5) See what keyword searches on Google led to the site being listed in the SERPs, and the click through rates of such listings
- 6) View statistics about how Google indexes the site, and if it found any errors while doing it

#### IV. WORKING PROCESS

**Directory Submission** Directory submission is one of the important techniques in SEO to create incoming links to a website through related page and category. A website is created and need to be rank to get good business results. Manually submission to directories is the best approach to rank your website. Internet directory is the platform on World Wide Web for information and links of many websites. Many directories are providing free service to website in directory [6]. To submit website in directories can produce web traffic for your website. This assist you to promote your business needs. The directory submission is used as SEO technique to promote your business.

**Keyword Generation** Any search engine optimization method used keywords generation process. The keywords are necessary and most important part of SEO. The keywords are must be related to business [7]. Because related keywords boost website in short span of time. There are many online tools available to generate keywords relevant your needs like: Word tracker, Yahoo keyword selector tool, Google Ad words keyword tool and Thesaurus etc. By using these tools just put one word related your website like gambling. But only keywords are not providing assurance to popularity of website.

**Link Exchanges** The link exchange is the method in SEO to place link on other websites and other websites place links on your websites means vice versa [8]. There are many types of link exchanges are used like: illustrate interest directly on web pages and other is that send email or discussion forums to show interest for link exchanges. Only related website but with good page rank websites are required to build reciprocal links.

#### V. WEB CRAWLING

Web crawlers are an essential component to search engines. Web crawling speed is governed not only by the speed of one's own Internet connection, but also by the speed of the sites that are to be crawled [9]. Especially if one is a crawling site from multiple servers, the total crawling time can be significantly reduced, if many downloads are done in parallel. Fig. 3 Web Crawling The Web crawler can be used for crawling through a whole site on the Inter-/Intranet. It specifies a start-URL and the Crawler follows all links found in that HTML page. a tree-structure, the root is the start-URL; all links in that root-HTML-page are direct sons of the root. Subsequent links are then sons of the previous sons.

##### A) Crawling Techniques

**Focused Crawling** A general purpose Web crawler gathers as many pages as it can from a particular set of URL's. Whereas a focused crawler is designed to only gather documents on a specific topic, and a crawler with dynamically reconfigurable priority controls which is governed by the classifier and distiller.

**Distributed Crawling** Indexing the web is a challenge due to its growing and dynamic nature. A single crawling process even if multithreading is used will be insufficient for large – scale engines that need to fetch large amounts of data rapidly. When a single centralized crawler is used all the fetched data passes through a single physical link.

## VI. INDEXING

Similar to an index of a book, a search engine also extracts and builds a catalog of all the words that appear on each web page and the number of times it appears on that page[10]. The parser can extract the relevant information from a web page by excluding certain common words (such as a, an, the - also known as stop words). Indexes are updated periodically as new content is crawled. Some indexes help create a dictionary (lexicon) of all words that are available for searching. A. Methods of Indexing 1) Full-Text Indexing As its name implies, full-text indexing is where every word on the page is put into a database for searching. Fulltext indexing will help you find every example of a reference to a specific name or terminology. In this case the websites are indexed by computer software. This software called "spiders" or "robots" automatically seeks out Web sites on the Internet and retrieves information from those sites (which matches the search criteria) using set instructions written into the software. 2) Human Indexing Yahoo and some of Magellan are two of the few examples of human indexing. In the Keyword indexing, all of the work was done by a computer program called a "spider" or a "robot"[8].

## VI. CONCLUSION

The study started with the aim to analyze the different techniques related to the SEO and know the aware of search-engine-friendly website is the first step towards SEO success. Based on the discussion it has been found that in case of the digital marketing the most important aspect is to connect with the users. Thus, with the rapid growth of technology, the search engines will continue to enhance and upgrade their search ranking algorithms, thus the developers or website owners must continue to enhance and learn new SEO strategies to increase the visibility, user base and to sustain higher ranking in the search results.

We have discussed many techniques in this paper, which can be used to increase the presence of a webpage on the internet

As the web and its usage continues to grow, many opportunities to analyse web data and extract all manner of useful knowledge from it. The web presents new challenges to the traditional data mining algorithms that work on flat data. Nobody have time to lose by searching the needed content in this fast life that is the area the semantic search engine gets the chance. Search engine and web crawler describes the functionalities of all the components involved in finding information on the web.



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