

SEO Tools and Techniques: A comparative Study

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ABSTRACT

Search engine optimization, or "SEO" should result in first-page rankings in organic search results. Some optimization approaches have remained constant over time and continue to be the foundation of SEO. New optimization approaches blossom and flop as Internet grow constantly. As a consequence, we examined the most crucial aspects that can assist in improving search results positioning. It's vital to note that none of the strategies can guarantee good rankings because search engines employ sophisticated algorithms to assess webpage quality and determine their stance in search results.

Keywords

search engine optimization, seo, search engine, optimization, web pages.

1. INTRODUCTION

The search engine is essential for finding information on the internet since it provides users with relevant information or results. A search engine is made up of a researcher, indexer, search engine, and user. To retrieve concentrated information, a fast and accurate search engine is essential. The search engine performs five basic activities in order to provide search results. As the first operation of a search engine, the crawler or spider retrieves all of the internet pages associated with a website. The next step for the search engine is indexing. All retrieved web pages were indexed and saved in a large database to be retrieved later. When the search for something using a search engine like Google, Yahoo, or Bing. SEO stands for search engine optimization. SEO is the process of optimizing web pages or entire websites in order to improve their ranking in search results. Improving the volume and quality of traffic to a website from search engines by designing and constructing a website to rank well in search engine results.

A search engine is a tool that helps users find information on the internet. Users enter keywords to identify websites that hold the information. It is a set of tactics that help your website rank higher in natural search results, making it more visible to individuals searching for the product or service. Online marketing includes SEO. The practice of making a website and its content extremely relevant for both search engines and the search era is known as SEO. A site's positioning for key words and phase can be improved by using search engine marketing. SEM, a phrase used to define search marketing methods, includes SEO as a subtopic. SEO is an important aspect of internet marketing since it allows website developers to achieve

a higher ranking in search engine results. Important benefit of SEO marketing website with decent content is that it is simple to understand. Effective SEO involves a significant amount of work, keyword selection, and ongoing monitoring of search engine algorithm updates, among other things. It has its own relevancy algorithm, which is updated on a regular basis. The relevancy algorithm will be updated, which will affect search engine rankings.

A search engine, such as Google, ranks websites based on their quality and the number of keywords they include. One may say that the higher and more frequently a site appears in search results, the more visitors it will acquire via the usage of search engines. The fact that many websites today obtain the majority of their online traffic through search engines natural results underscores the importance of this. People use search engines to find answers to their questions, but they only look at the first page of results, with only 2-3 percent going on to the next page for more information (expect researches). Consider this: if an organization's page is on the second, third, or fourth page, the business that can be produced from that page is unlikely to return, and users will prefer the page on the first page. Every day, search engines index trillions of web pages. Every day, millions of searches are conducted. The majority of users see the website from search engine links and feel that companies listed at the top of the results are the best in their product, service, or category. Unpaid search result is a method of enhancing the visibility of a page through natural means. The website is redeveloped during this procedure to make our keywords more effective in communicating with search engines.

SEOs may target image search, academic search, local search, and video search for this job. Editing text and html codes to boost relevance to specific keywords and correct indexing in search engines is part of optimizing a page. The text and coding are adjusted to match the indexing patterns of search engines, which are carried out by a crawler known as Google Bot. It is the most effective method of contacting customers since they meet them when they are in need. During their searches, the majority of people come across targeted websites. Profit and nonprofit organizations of all sizes and from many industries appear to be particularly interested in and focused on the internet market with their initiatives and ideas, realizing that web pages offer very substantial and appealing marketing potential. SEO is a strategy of increasing the potential of a website in order to get early top rankings in search engine

results. SEO entails both natural search and ordering according to the top listings of search engine results pages, both of which are critical to successful web site development because they quickly make websites known to the public and make it difficult for them to maintain a steady stream of visitors among the vast number of websites available on the internet.

The most difficult duty for website developers and webmasters is SEO. It is widely recognized that search engine websites are a primary resource of internet users who use them to find information they need for academic purposes as well as to improve public relations by providing goals, information, and services through search engine marketing, which is highly recommended because it makes it difficult for buyers and sellers to meet.

2. LITERATURE REVIEW

Internet search engines has various distinct qualities as both information gathering vehicles and advertising mediums. To begin with, Search engine are normally free to use, indicating that using one search tool does not exclude using other search engines. Telang et al. discovered this phenomenon in an analysis of search market structure [1]. There is no charge for access, search engines attempt to improve user happiness with their search experience by providing high-quality results. A search engine's capacity to do so is largely determined by page rating page inclusion. User happiness is influenced by page ranking [2]. As a result, the quality of top results has the greatest impact on user happiness. Because there is very little overlap across top search engines in regards of their first two result pages, there are significant disparities between search engine in terms of top outcomes at the moment [3]. P. Chahal. M. Singh, and S. Kumar presented a technique that improves the efficiency of user search data. This approach establishes a link between searches, documents, and user requests. Take into account the logical document structure as well as the user inquiry. The proposed method produces better outcomes than earlier methods [4].

A simplified page ranking method was presented by G. Kumar, N. Duhan, and A. K. Sharma. The new algorithm uses inbound visitor links on pages to calculate page rank. This paper introduces VOL, unique PR method that outperforms the original. The results reveal that VOL is superior to the original PR algorithm, and that pages with more incoming link visits have higher rank value than pages with fewer visits. A method for discovering the link-visit frequencies of Web pages is also shown, as well as a comparison of VOL and the PR algorithm [5]. Except for a theoretical research by Sen, the influence of SEO has been rarely studied in published studies. Sen's research focuses on the search engine marketing approach of an online seller who, in addition to setting prices, decides between paid placement, SEO, and no advertising at all. Surprisingly, he discovers that, in balance, SEO is not the best option, even when SEO costs are comparable to paid placement. This research differs from his previous work in that it focuses on the net payout from internet advertising in the presence of SEO. Surprisingly, some of the outcomes of this study corroborate Sen's conclusions [6].

Isadora [7] investigated the foreign website of Oulu University of Applied Sciences on-page SEO. Her findings demonstrate the importance of web content production and semantics for internationalization. According to the preceding literature assessment, empirical research on SEO strategy for higher education internationalization is scarce. In addition, this research will add to the existing knowledge on SEO and internationalization in higher education. Delgado-Márquez, Hurtado-Torres, and Bondar [8] investigated the globalization of higher education sector through web ranking in order to provide visibility. Their studies demonstrated that standard university institution rankings, such as international faculty ratios and international student ratios, do not accurately reflect the primary variables involved in their internationalization processes.

3. SEO TECHNIQUES

SEO is a method of obtaining higher SE rankings for Web Pages or websites in order to increase the likelihood of website access. With the introduction of Bing, Yahoo, Google, and Ask, SEO concepts and SE advancements have been in the works. SE is a procedure that relies on a variety of strategies for collecting information from the Web, organizing and analyzing the information found, and showing the query results to consumers in a systematic manner.

When it comes to overall SEO, there are two approaches that are equally important: on-page and off-page SEO. This is shown in Figure 1

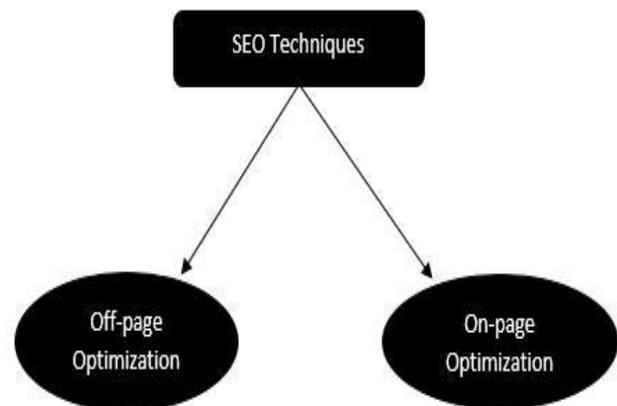


Fig 1: SEO Techniques

3.1 On Page Optimization

The goal of on-page SEO is to increase your rankings by creating new content. This entails, among other things, inserting terms into your web pages, generating high-quality content on a regular basis, and ensuring that your factors that might affect and headers are keyword-rich popular and highly. This procedure aids the crawlers in reading the content of the website. A well-written website indicates quality and leads to higher page rankings [9]. Keywords in the meta tag, title tag, phrasing, position, external link, density, and other website design features are all controlled by the site itself. Even if there isn't a straightforward step-by-step approach to improving on-page elements of webpages, the following list tries to cover the

bulk of the most popular elements, which are divided into four categories:

3.1.1 Speed of the server

Accelerating server system performance is an important aspect of on-page optimization because search engines analyze website load times as part of their analysis for ranking considerations.

3.1.2 Source Code

Improved website performance can be aided by efficient source code. To make it easy for the Search engine bots to index the site, unnecessary functionalities or code portions can typically be deleted or other aspects combined.

3.1.3 Text

Text optimization has long been done on the basis of relevant keywords. The goal of data optimization ought to be to generate a text that covers term permutations and full keyword clouds as well as feasible. That's how to guarantee that the information accurately and comprehensively describes a topic. That's no longer sufficient to optimize texts only for the purposes of search engines.

3.1.4 Meta Tags

On-page SEO includes meta titles, which are crucial page elements for rankings, as well as meta descriptions, which appear in search engine results pages. Even though they're not immediately apparent to users, they should be optimized alongside the contents and graphics. This ensures that the keywords and themes discussed in the text and those utilized in the meta description are closely related.

3.1.5 Structure of the URL

We should enhance the stability of URLs by employing words, as easy-to-understand URLs will easily transmit content information. Because the URL to a site is included in the search queries after the title, it provides the users and search engines with more details about the website than an ID or curiously named parameter would. In SEO, shorter URLs are also preferred [10].

3.2 Off Page Optimization

Off-page SEO refers to optimization that takes place outside of your website, such as obtaining backlinks. Building relationships and providing content that people want to share is part of this equation. Though it necessitates a lot of effort, it is critical to SEO success. Off-page SEO is thought to be a supplement to on-page SEO. It focuses mostly on backlink generation and social media marketing. Having links from a page with a high ranking and visibility is a relatively new technique. If the webmasters team is supplied with high-quality web researchers, it is the ideal method for staying ahead of the competition. In summary, it includes techniques such as blog posting, Backlinks Generation, social networking, press releases, video submission, and article submission, among others [11].

3.2.1 Backlinks Generation

Usually tend to increase our website's link on other websites as a result of this procedure. Backlinks are the best way to boost the rank of a page/website, and the best way to improve backlinks is link exchange or uploading the URL while doing online advertisements, according to search engines. If a page has an increasing number of backlinks, it means there is something relevant in the page for which other pages are providing links to it [12].

3.2.2 Blog Posting

Being on a blog such as Blog spot, WordPress, Thoughts, Link orbits, and other similar sites is always a smart idea. According to a survey, firms with blogs had 55% more visitors, 97% more inbound links, and 434% more indexed pages than those without [13].

3.2.3 Social Networking

It's the most recent method for increasing brand awareness. It is a method of sharing data on websites that allows for content sharing, data exchange, and the addition of original content, among other things. Blogs, podcasts, and community-based online portals like Facebook, MySpace, LinkedIn, Twitter, Digg, Reddit, and others are examples of different social media platforms. These social media technologies include text, image, audio, and video sharing among users' content.

3.2.4 Media Release

When a media release is issued and syndicated through other industry or news sites, it gives a web site a boost. We shouldn't pass up the chance to build useful backlinks to our site, which will help us improve our search engine ranking and authority.

3.2.5 Video Submission

Videos are used in a variety of ways to improve search engine optimization, but they must be relevant, interesting, and packed with information. The best option is to use step-by-step videos that focus on the procedures.

There are five ways that are equally important when it comes to the overall SEO process. This is shown in Figure 2



Fig 2: SEO Process

4. TOOLS

4.1 Mangools

The Mangools set of SEO tools shares the same fundamental functions as ahrefs, Moz, and SEMRush, except maybe automatic reporting. KWFinder, which offers the most useful keyword ideas of any product on this list, is where it really excels. Companies can construct a strong list of fresh keyword recommendations to help them in enhancing website ranks, and the Rank Tracker tool facilitates company ratings and progress measurement [14].

4.2 Serpstat

Serpstat offers a basic SEO toolkit, which includes competitor research, keyword research, backlinks analytics, site audit, and rank tracking. While its performance overall may not match that of its competitors, it is less expensive than other tools with comparable feature sets. Small businesses will find it appealing, but more prominent feature should consider investing in a more sophisticated platform [14].

4.3 SEMRush

SEMRush is sometimes referred to as the "Swiss Army Knife" of SEO tools because of its extensive functionality. Its backlink data isn't as comprehensive as ahrefs', but it compensates with other advantages. Its "Domain Vs. Domain" tool, in example, is particularly beneficial, allowing businesses to rapidly compare their website to competitors. This tool may also help businesses compare terms and domains by generating analytics reports that show website traffic, search statistics, and rival performance. Users can also use the On-Page SEO Analyzer to track ranks and get advice on how to improve their website's performance [14].

4.4 SpyFu

SpyFu appears to be appealing to younger businesses because to its affordable membership costs and free add-on services. Its feature set isn't as extensive as some of the other tools on our list, therefore its main selling point is the ability to monitor your competitors' PPC spending. In other words, rather than the completely SEO-focused products elsewhere on this list, it's better used as a PPC tool with some SEO capability [14].

4.5 Google Analytics & Search engine

Search Engine focusing nearly solely on SERPs and relevant analytics, whilst Google Analytics is focused on visitor

behavior after they've clicked through to your site. They work together to give you a complete picture of your website's performance and to help you learn more about your visitors. The lack of a keyword research tool and their user interfaces, which are less straightforward for novice users than other services, are where both Search Engine and Google Analytics fall short. Search Console's backlink analysis features are significantly less effective than among its competitors [14].

4.6 Maz Pro

Keyword research, backlinks analytics, site auditing, and on-page optimization are all part of Moz Pro's SEO toolkit. It integrates the measuring system capabilities of Moz' s research previously (such as Moz Analysis) with extra features such as site auditing to provide immediately actionable insights. Its user interface is simple, and we give it a good rating for Ease of Use [14].

4.7 Ahref's

The original purpose of Ahrefs was to analyse a website's backlinks, but it has subsequently expanded its capabilities to include a larger range of uses for necessary criteria SEO health. Its extensive backlink checking service remains a standout, but its analysing competition search traffic is almost as impressive. Its user interface is also simple, but its feature set is more comprehensive than that of other premium programmes, resulting in a longer learning curve [14].

5. Result

The performance of each SEO tool for such six specified features of an Optimization tool is compared in the table below:

Keyword research: Identifying and recommending appropriate keywords.

Rankings: Keeping track of where webpages appear in Google's search results (SERPs).

Competitor analysis: For each term, research and evaluate competitor websites and competitiveness.

Backlink tracking: External backlinks are identified and analyzed.

Visitor behavior analysis: Conducting qualitative research on online user behavior, as well as tracking user activity along a website trip to uncover experience breakdowns.

Automated reporting: The users can track all key SEO KPIs in one place.

Tool	Competitor Analysis	Rank Tracking	Backlinks Tracking	Keyword Research	Automated Reporting	Visitor Behavior Analysis	Best For
Mangools	Yes	Yes	Yes	Yes	No	No	Marketers are mostly concerned with locating fresh keywords.
Serpstat	Yes	Yes	Yes	Yes	No	No	Companies with a tight budget who require a comprehensive range of tools.
SEMRush	Yes	Yes	Yes	Yes	Yes	No	Companies that want to analyze their SERPs to the SERPs of two or three specific competitors.
SpyFu	Yes	Yes	No	Yes	No	No	Marketers who are mostly focused on PPC and require a basic SEO tools.
Google Analytics & Search engine	No	Yes	Yes	No	Yes	Yes	Everyone, especially when combined with commercial tools for more in-depth reports.
Maz Pro	Yes	Yes	Yes	Yes	Yes	No	Junior marketing and small enterprises in need of a feature-rich, simple-to-use platform.
Ahrefs	Yes	Yes	Yes	Yes	Yes	No	Marketers with a lot of experience who can take advantage of the complex capabilities.

Table 1 [3].

6. CONCLUSION

The visibility of your website is dependent on SEO (Search Engine Optimization). It's a crucial technique of demonstrating to Search engines such as google that your site is convenient for users and their search results. SEO consists of several components, and understanding what these are but how they perform is crucial to comprehending why Search is so vital. In a nutshell, SEO is important because it increases the visibility of your website, which means more visitors and opportunity to converting prospects into customers. In this study, we have enlighten tools and techniques of search engine optimization which are used by organization for higher ranking and increase the visibility of their website. Also, we have discussed about how different researchers have introduced many search algorithm, tools and techniques for search engine optimization. Also in this paper the comparison of relative features of seo tools are shown in Table 1.

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