# Review Paper on Search-Engine Optimization

Shraddha Londhe[1], Dr. Hemant Deshmukh[2]
Dr. Rajendra Gode Institute of Technology & Research, India

**Abstract:**
Search engine optimization (SEO) is the process of affecting the visibility of a website or a web page in a search engine's "natural" or un-paid ("organic") search results. In general, the earlier (or higher ranked on the search results page), and more frequently a site appears in the search results list, the more visitors it will receive from the search engine's users. SEO may target different kinds of search, including image search, local search, video search, academic search,[1] news Search and industry-specific vertical search engines. 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 back links, or inbound links, is another SEO tactic.

## I. INTRODUCTION

Search Engine (SE) is a tool that enables users to locate information on the World Wide Web. Search engines use keywords entered by users to find Web sites which contain the information sought. Search engine optimization (SEO) refers to techniques that help your website rank higher in organic (or "natural") search results, thus making your website more visible to people who are looking for your product or service via search engines.[1]SEO/SEM is a form of online marketing, Search Engine Optimization / Search Engine Marketing is the process of making a site and its content highly relevant for both search engines and searchers. Successful search marketing helps a site gain top positioning for relevant words and phrases. SEO is part of the broader topic of Search Engine Marketing (SEM), a term used to describe all marketing strategies for search. SEM entails both organic and paid search. With paid search, you can pay to list your website on a search engine so that your website shows up when someone types in a specific keyword or phrase. Organic and paid listings both appear on the search engine, but they are displayed in different locations on the page. Search engine optimization (SEO) is the process of affecting the visibility of a website or a web page in a search engine's "natural" or un-paid ("organic") search results. In general, the earlier (or higher ranked on the search results page), and more frequently a site appears in the search results list, the more visitors it will receive from the search engine's users.[1] SEO may target different kinds of search, including image search, local search, video search, academic search, news search and industry-specific search engines. 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,

## II. SEARCHENGINE

A web search engine is a software system that is designed to search for information on the World Wide Web. The search results are generally presented in a line of results often referred to as search engine results pages (SERPs). The information may be a mix of web pages, images, and other types of files. Some search engines also mine data available in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintain real-time information by running an algorithm on a web crawler.



**Figure. 1. Structure of SE**

Web search engines work by storing information about many web pages, which they retrieve from the HTML markup of the pages. These pages are retrieved by a Web crawler (sometimes also known as a spider) — an automated Web crawler which follows every link on the site. The site owner can exclude specific pages by using robots.txt.[1]
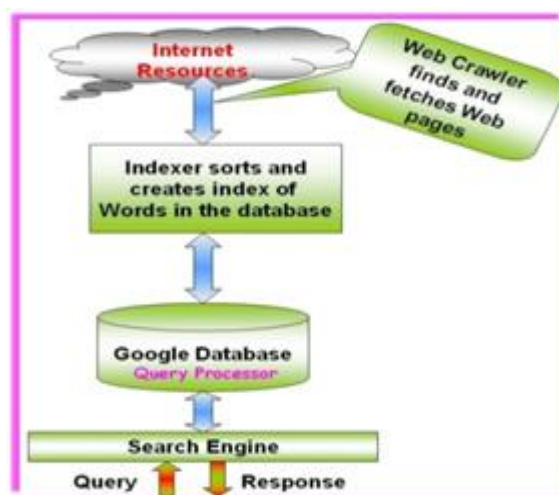


**Figure. 2. Working of Google SE to give result**

With the help of internet resource the web crawlers finds fetches the web pages and those web pages are indexed and are sorted by words in the database which is further process towards the Google database for query processor which is further carried towards search engine for response.[5]

## 2.1 Search Engine Optimization

Search engine optimization (SEO) is the process of affecting the visibility of a website or a web page in a search engine's "natural" or un-paid ("organic") search results. In general, the earlier (or higher ranked on the search results page), and more frequently a site appears in the search results list, the more visitors it will receive from the search engine's users. SEO may target different kinds of search, including image search, local search, video search, academic search,[1] news search and industry-specific vertical search engines.



**Figure. 3. Various Search Engines**

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 back links, or inbound links, is another SEO tactic.

## 2.2 SEO AND SEARCH ENGINES

Search engines are clearly foundational to SEO, but many organizations lack knowledge about how they work. Websites host a range of HTML documents, each with a unique Uniform Resource Locator (URL). A search engine enables Web searching by creating an index, a process transparent to the user, and responding to queries, a process that requires the user's active participation.
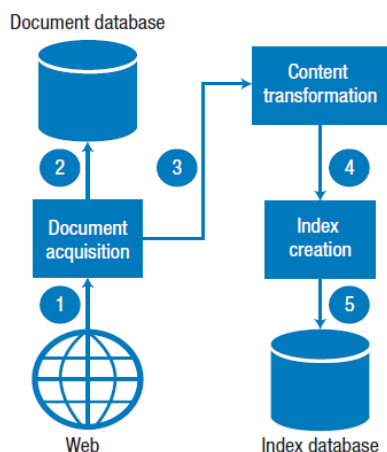


**Figure.4. Indexing. Indexing involves fetching HTML documents, storing them in their original form, transforming the documents by processes such as stop-word removal and stemming, and generating indexes and storing them in a database**

Figure 4 shows a conceptual schematic of webpage (or document) indexing. The circled numbers correspond to

The following steps:
1. A web crawler, also known as a robot or bot, scours the Web to retrieve HTML pages.

2. The web crawler stores these pages in their original form in its search engine's document Database.

3. The pages go through transformations, such as HTML tag and stop-word removal and Stemming. The transformation, conducted by the search engine, extracts significant textual content and information about links for indexing

4. The search engine creates indexes by generating direct and surrogate page representations, such as single words or phrases and their positional information on the page. It also notes information about incoming and outgoing links and generates a snippet.

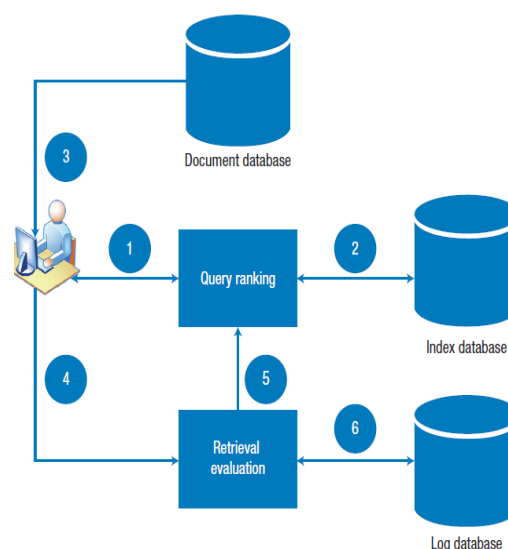5. The search engine stores indexes in its index database.



**Figure.5. Querying and document retrieval. From a user query, an algorithm generates a ranked list of relevant documents, from which the user browses retrieved documents by clicking on the corresponding links. Queries can be refined and re-executed on the basis of user feedback, and the search engine stores meta information about the current search to improve its future performance**

Figure 5 shows a conceptual schematic of the querying and document-retrieval process. The circled numbers correspond to the following steps:
1. The user employs a search engine's browser to enter a search query—typically a single keyword or short phrase. As in step 3 of the indexing process, the search engine transforms the user's query in canonical representation.

2. The search engine's query-ranking algorithm generates a ranked list of URLs for documents it deems relevant on the basis of the index database and contextual information in the user query. The search engine then shows the snippets corresponding to the ranked URLs tote user in SERPs.

3. The user browses the snippets and clicks on certain ones to retrieve the corresponding full documents in their original form from the document database.

4. The search engine's retrieval evaluation component helps the user further refine the search on the basis of feedback about the document's relevance: the user explicitly indicates relevance (direct feedback) or clicks on relevant links (indirect feedback).

5. Using the relevance feedback, the search engine might reformulate the user query and re-execute it. This process repeats until the user is satisfied with the search results or ends the query session.

6. The search engine stores Meta information such as user queries, relevance feedback, and clicked snippets in the log database, which it uses to improve its search performance.

## III .SEO TECHNIQUES

### 3.1 Optimize Title Tags
o   Every page on your website should have its own unique title tag.
o   From an SEO perspective, a good title tag should:
o   Be no more than 70 characters (including spaces)
o   Include both product- or service-related keywords and your   company's brand name
o   Be both intriguing and informative enough to prompt search engine users to click through to your page (as title tags are typically used in the snipped displayed in the natural search results)

Example of how this and the following SEO techniques could be put into practice. Suppose you run an auto body shop in San Francisco, CA. You've recently launched a new website which includes a page on your current specials.[5] after conducting your keyword research, you've decided to target the phrase "auto body coupon," along with location modifiers that put your website in front of consumers in your city.

### 3.2 Create Compelling Meta Descriptions
Along with title tags, the section of every page on your website should contain a customized meta description. These brief page summaries should be no more than 150-160 characters long and should include at least one mention of your page's target keyword phrase. Following our previous example, your meta description could read something like this: "Need quality auto body repair work done at a discount price? Check out the latest auto body coupon codes from Frank's Auto of San Francisco, CA." While meta descriptions don't hold nearly the SEO weight that they used to, their presence in the snippets found on search engine results pages plays an important role in your site's overall click-through rate (CTR). By writing your meta descriptions in a way that captures search users' attention, you'll increase the number of visitors who choose to click on your listing compared to your competitors'.[5]



**Figure. 6.  Title tag and Meta**

### 3.3 Utilize Keyword-Rich Headings
Both the title and meta description should be included in the section of every page on your website. When it comes to your pages' body text, one of the best things you can do to improve your overall SEO value is to include <h2> and heading tags containing your target keyword phrases in your content. Not only do the search engines place added weight on the words found in these particular tags, the visual relief they provide to your website's readers will help them to move more efficiently through your site's content.[5]



**Figure.7. Figure showing heading tag**

### 3.4 Add ALT Tags to Images
If you choose to add images to your web pages, make sure to add ALT tags to them as well. ALT tags originally came about to provide visually impaired website visitors using text-to-speech devises with additional information about the content on their screens. And though this initial purpose is still valid, the content found in these fields is also important when it comes to SEO. Again, you shouldn't "stuff" your ALT tag full of target keywords and keyword variations. Instead, use your ALT tags to clearly and accurately describe your website's images, working in keyword phrases as they occur naturally.[5]
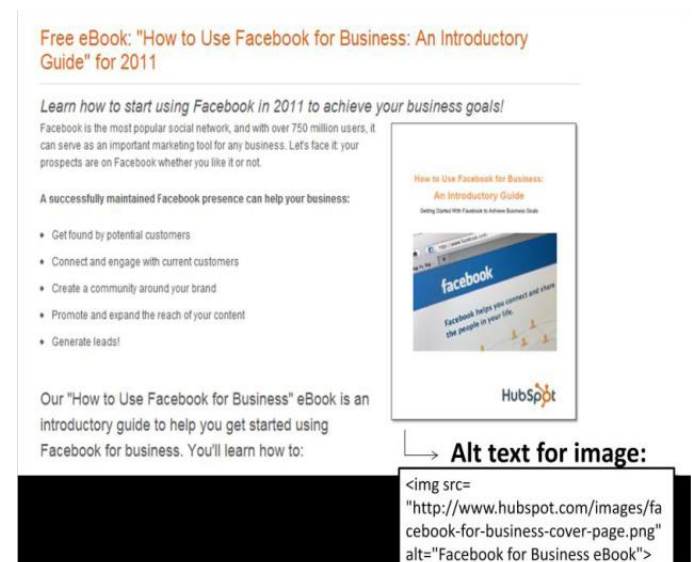


**Figure. 8. ALT tag to image**

### 3.5 Create Sitemap
In the world of SEO, the search engines' indexing programs – commonly referred to as "spiders" – play the important role of analyzing new websites (or new content added to existing websites) and adding their content to the lists of pages that can be displayed in response to user queries. As a result, facilitating the easy movement of these spider programs throughout your own site is an important part of optimizing your content for natural search traffic. One of the best things you can do to help the spiders index your website is to create a sitemap – a page listing links to all tmhe other pages on your site. There are plenty of different automated tools that can generate these important pages for you, though you can always create a sitemap by hand if your site is small.[5]

### 3.6 Build Internal Links between Pages
Another way to help the search engine spiders to catalogue all of your site's pages is to create internal links that connect your different pieces of content. As an example, instead of simply linking to your "Contact" or "About Us" page from your navigation bar, consider adding text links to these pages from

within the body content found on your home page. Doing so is a great way to help your visitors find the information they're looking for, in addition to providing a major SEO boost to your site's content.



**Figure. 9. Figure showing internal link between pages**

**3.7 Update Site Regularly**
One final SEO technique you'll want to implement is to update your site periodically. Because the search engines' top priority is serving up the results that will best meet their users' needs, they prefer to share websites that contain the latest, most up-to-date information. In addition, the more content you post to your site, the more keywords your website will include – increasing your odds of generating search engine traffic. The easiest way to make regular updating a part of your SEO strategy is to create a company blog or news section. Either one of these tools will help you to connect with your readers, while also appeasing the search engines' desire for fresh content.[7] Unfortunately, implementing these seven basic SEO techniques on your website alone isn't enough to guarantee that your site will reach the coveted top spot in the search engine results pages for your chosen keyword phrases overnight. Realistically, SEO is a process that takes time to deliver results – though many new webmasters find this frustrating. Instead of getting overwhelmed by the number of different SEO techniques out there, start with these seven basics. Over time and with continued commitment to pleasing both your readers and the search engines.

**5. CONCLUSION**

o       The search engines are getting more and more advanced in determining how and what webmasters are doing to get the rankings

o       SEO is the act of modifying a website to increase its ranking in organic (v/s paid), crawler-based listings of search engines

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