Analysis of Techniques used in Search Engine Optimization

Ms. Amrita Kungwani (Author 1)
Dept. of Computer Science and Engineering
Jhulelal Institute of Technology
Nagpur, India

Ms. Mona Mulchandani(Author 2)
Dept. of Computer Science and Engineering
Jhulelal Institute of Technology
Nagpur, India

Ms. Nisha Balani (Author 3)
Dept. of Computer Science and Engineering
Jhulelal Institute of Technology
Nagpur, India

Abstract— **Rapid evolution of the cyber world has greatly facilitated the availability of manifold data on web. Accessing relevant web information through search engine has become very common. The process begins with the user submitting some Query in textual format via search engine to a typical set of corpus Documents stocked on scattered web-sites. This triggers various Search Techniques to locate ranked set of documents more relevant to query based on Indexing, which attaches certain weight to the results. Search Engine Optimization (SEO) is a collection of techniques to affect the visibility of a web page in search results.**

Index Terms — Search Engine, Search Engine Optimization, Techniques, indexing, query.

I. INTRODUCTION

Search Engine is a tool that helps users to locate information on the World Wide Web. Search engines use keywords entered by spectators to find Websites which contain the information sought. Search Engine Optimization is the process of making a site and its content highly relevant for both search engines and spectators. The higher a Web site rank in the results of a search by search engine, greater the chance that site will be visited by a searcher. Search engine Optimization is not easy. It is more about strategy, procedure and structure. It can be considered as a form of engineering. SEO services facilitate the increase in website sales, traffic, and exposure of a website. Two types of Techniques are used in search engine optimization. First is On-page SEO Technique and the other is Off-page SEO technique.

II. SEARCH ENGINE

Indexing software is used in Search Engine which is generally known as robots or spiders. These are programmed to find new documents or updated ones. Spider crawls the website for finding these new documents by following the hyperlinks of those websites which are already in the database of the search engine. Search engine then creates the index of the content and add it to their databases. Search engine ranks website by using factors and the weight is assigned to them by using their own mathematic formula. The index takes into account, the words that are on the crawled webpage, the location where

they are listed and their coding. So whenever a query is entered b the user in the search engine, the search engine first checks its own index by scanning its list, and if it finds the matching record it sends the result back to the user.

Types of Search Engine:

- Full Text Search Engine: Full Text Search Engine acquires information from internet, establish database and retrieve the records according to user's query. It can be divided into two parts: first one which has its own crawler. Second one is to hire other search engine's database.
- Directory Search Engine: It cannot be called a true search engine. It acquires all the entries of directory listing.
- META Search Engine: It provides search results from multiple search engines working simultaneously according to user's query.
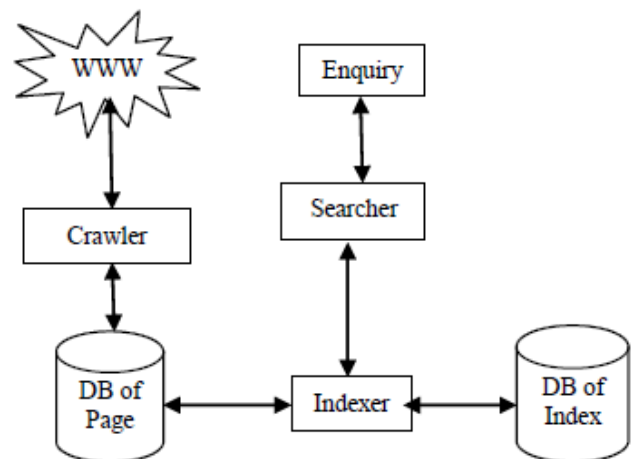- Vertical Search Engine: The main focus is on specific search field and search demand

Fig 1: Search Engine Structure

III. SEARCH ENGINE OPTIMIZATION

Whenever we enter a query in a search engine and press enter key we get a list of web pages as a results that contain that putted query term. Spectators normally visit those websites or web pages that are at the top of this list as they identify those to be more appropriate and relevant to the query applied. The process of producing the most relevant and appropriate results with respect to the query entered by the user is called Search Engine Optimization (SEO).Search engine optimization is a best practice that includes right strategies and powerful techniques used to enhance the amount of visitors to a website by obtaining a high ranking placement in the search results page of a search engine (SERP) -- including top search engines like Google, Bing, Yahoo and others.

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KEYWORD RESEARCH
        ⇩
GOAL SETTING AND REPORTING
        ⇩
PAGE OPTIMIZATION AND CONTENT DEVELOPMENT
        ⇩
LINK BUILDING
        ⇩
FOLLOW UP REPORTING
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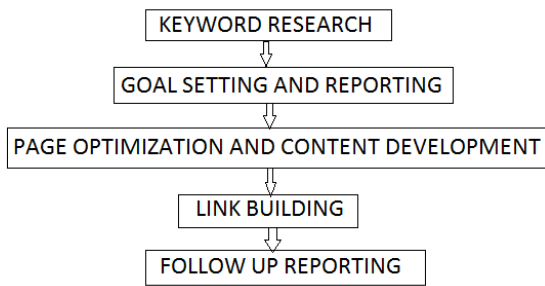
Fig 2: Search Engine Optimization

SEO Types-
- White Hat SEO-

It is the proper and best way to optimize any website. This technique is well supported and appreciated by all search engines, mainly by Google. This is a natural way to achieve better results, if the website is regularly updated with quality and unique content, gets better links from relevant niche websites and blogs. This means that the webmaster does not mislead the search engine.
- Gray Hat SEO-

In Gray Hat SEO the optimizer may buy or exchange links with other websites to get better search engine ranking but it will be not accepted by the search engines. This technique is short term for search engine ranking.
- Black Hat SEO-

These techniques are unethical way of manipulation of search engine's algorithm. These techniques are not recommended since there is a risk of website getting removed from the search database index. This technique does not always increases the ranking but also increases the chances of the website getting banned by the search engine.

IV. SEARCH ENGINE OPTIMIZATION TECHNIQUES

There are two types of techniques used in optimization-
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A. On- Page SEO Technique
Users fire query to search information on search engines. Keyword represents the relationship between search term

present in the query and several billion of web pages. On-Page SEO includes:
- Location of keyword: Search engine crawler checks whether keyword appear in <title> tag; <header> tag; <alt> tag; <meta> tag; <body> tag, in anchor text, in URL entered by user.

- Title tag: Title is the greatest ranking factor. Most search engine use the website's title tag as a main factor of selecting a site as relevant to the query to the user.

- Keyword density: Density of Keyword means frequency of keyword existing on web page compare to total number of words present on the page. Frequency of keyword in title tag and frequency of keyword in body tag should be strong enough so that it can be selected as an result to be displayed by SEO. Density of keyword should be in the range of 2% -8% for improving website ranking.

- Keyword in URL: A website can be found more easily by search engine crawlers if keyword is present in URL. Search engine gives priority to different domain name suffixes like edu or gov. Also shorter length URL is preferred in Search Engine Optimization.

- Keyword in Meta tag: The meta description tag contains data about the page that is informative and reflects the content of web page. The website will be indexed if related keywords are present in meta description tag.

- Keyword in alt text: Alt text or tag specifies appropriate text for images. Descriptive text is associated with alt tag that serves same purpose and conveys same essential information about the image. Basically Alt tags are short and descriptive which reflect the body text that describes the image.

- Keyword in anchor text: Search keyword present in the anchor text represents what is linking. Pages using text linking based on search keywords often are considered more relevant to the query fired.

- Title Length: The most important on-page factor is judicious use of appropriate keywords in title tag. Limited Title length always returns a good result.

- URL (Uniform Resource Locator) Length: URL gives the address of site on internet. Search keywords are included in the URL specified so that crawler will find web page. Short length URL's are preferable by search engines.

- Outgoing Link: Web pages are interlinked with other websites. Related outgoing links provide useful information to the spectator. More number of unique outbound links improves the website rank.

B. Off- Site SEO Technique

Off-site optimization includes the links that point to the site from other web pages. These links are called back links. Site with most back links in most cases will have a high rank. Offsite optimization includes the following techniques:

- Link Reputation: Web pages and websites with more number of back links are more preferable but it is important that the quality of external links is also maintained. External links must have good reputation by containing relevant or similar content.

- Click Popularity: The number of clicks to the site is the click popularity. If visitor clicks websites, search engine assigns a certain value to that site. Search Engine keeps a track of who is clicking by tracking the visitors IP address. Therefore the owner can't click to his site hundreds of times to improve click popularity as clicks from single IP address will be considered only once.

- Inbound Link: High quality external links that points to a website are called inbound links. Total number of inbound links is known as link popularity. In Google, page rank of website is determined according to quantity and quality inbound links. A Web page must contain a good number of relevant inbound links to rank high in search engine result. Inbound links in textual is preferred by search engines rather than images, banners or advertisements.

V. ADVANTAGES OF SEARCH ENGINE OPTIMIZATION

- SEO helps in increasing web-site traffic
- Promotion of brand name or product visibility and also raise the business services.
- Increase in sales and popularity of the product.
- Organic listings are free and when you are listed at the top, you don't need to pay per click or allocate a budget for advertising.

VI. CONCLUSION

Search Engine is a tool that helps users to locate information on the World Wide Web. Search Engine Optimization is the process of making a site and its content highly relevant for both search engines and spectators. The higher a Web site rank in the results of a search by search engine, greater the chance that site will be visited by a searcher. There are three types of SEO: White Hat, Gray Hat and Black Hat, out of which White Hat is advisable. There are two types of SEO techniques which are on-Page and Off- Site.

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