How to boost up website optimization

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Abstract

Search engine optimization is the set of protocols that can be used by the website developers to make the website easily reachable by the web users and also increases ranking of website in the search engine.Nowadays SEO is most powerful tool for the business persons to gain more traffic to their website and make larger sales to reach their business goals.In this paper we provide the basic knowledge about SEO and the strategies used to make website ranking high.

Keywords: Search engine optimization (SEO), page rank (PR), Search engine result page (SERP).

1. INTRODUCTION

Internet is widely used for searching, sharing and exchanging data world wide. Nowadays as the no. of web user increases rapidly the need of efficient search engine is also necessary to provide the web users with relevant information they need. Although there are many search engines available like yahoo, ask, bing etc but Google is the first word that comes in the mind of web users whenever they want to search for any kind of information over the internet.Search engine optimization is a technique which increases the visibility of a website. Search engine optimization is very important tool for the web based business and individuals. There are basically two rules to enhance visibility of a website first is the website should contain only relevant content and must contain some key terms that the web users usually use as a search string to reach a particular website, business or an organization [1]. Second most important rule is that website must contain high quality links. Two types of search engines are used i.e true search engines and search directories. True search engines such as google, altavista and excite send the robots or spiders to index the website, and then the website is evaluated and cataloged in the search engine [2].

A spider is a program run by the search engine to index the website content. In Search directories such as yahoo and DMOZ, human editors review the website content and catalogue the website in the directory. Search engines mainly concerned with quality of website content whereas directories focuses on visual appearance of a website. Directory search results mainly falls into 2 categories: Natural search results and organic search results. Natural search results include those websites that are cataloged in the directory. But the organic search results are those that are not too paid for. People will often confuse with the terms page rank and site visibility. Website visibility refers to the position of your website in the search result list when someone queries the search engine with the keyword that

is included in your website [3] [4]. A page rank is that the web pages that are linked to your webpage gives more page rank to your webpage. Similarly if the page rank of webpage linked to your page is high then it will boost the rank of your web page. Link Popularity is another important measure of no. of links from other website to your web pages. There are many types of links between websites such as:

a.) Inbound Link
b.) Outbound Link
c.) Reciprocal links
d.) One way links
e.) Paid link submissions

Inbound links are the links from some other websites to your website and outbound links are the links from our website. Reciprocal links are those when you link others website and they link you website in turn. Paid link submissions are those for which we have to pay to the website to include our link in their website. One way links are from one site to another site. The objective of web owners is to make their website appear on the top of search result list and the process used to achieve this objective is referred to as search engine optimization (SEO) [5].

1.1 Search Engine

Search engine is software that is used to collect and store data about the websites on the internet. The data about the website includes website URL's, keywords that defines the content of website, code structure that form the website pages and also list the links provided in the website. The web search engine collects the data about websites, index the collected data and store it on the search engine database. The most commonly used web search engine software are spiders, crawlers and bot [6]. Web search engine performs its operation by using some programs known as spider or bot. They navigate thru web pages periodically in order to keep track of changes that have been made. Data obtained by these programs are stored in large databases. Whenever the web user search for any kind of information on the web, web search engine searches for the related information in its index and provides results to the users. The competition among search engines is the sorting of the relevant results. At this stage search engine plays an important role to show the most relevant results on the top of resulted list of web pages [7] [8].

1.2 Search Engine Optimization

Search engine optimization is a process of optimizing the search results based on website design, their content and hyperlinks on the web pages. As the web users only evaluate the first 5 or 6 results and the remaining results are not viewed by the user [9]. This increases the demand of website owners/developers to move their web pages on the top list by using various optimization algorithms. The search engine optimization process for moving the web page on top priority is represented by the figure 1. Search Engine Optimization (SEO) is concerned mainly with the page hit ratio and frequency of hits, as increasing number of websites suffers in competition in terms of ranking [10]. Therefore, search engines are the most important tools, which play a significant role for the websites to reach the users, in order to get higher ranking. In early days the linking between websites is considered as important for website ranking but nowadays many tools are developed to understand the web users surfing behavior and their interests [11].
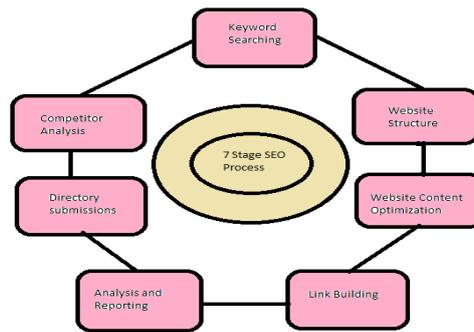
Fig 1. Search Engine Optimization Process

We analyzed various attributes that affect SEO, such as duration of the website session, site opening speed, bounce rate, and usability.

2. CRITERIA TO ENHANCE SEARCH ENGINE RANKING

A. **Design of website**: Design of website plays important role in optimization of search engine ranking. Although animations in the webpage increases the appearance of the website but it requires more loading time so the animations used in the website should be minimum. Also the text written in the animated images is not indexed by search engines. Website must be in HTML format and should be simple in structure [12].

B. **Title Labels:** Title of each web page should be unique and included in head label. Title must be of 60-80 characters to be easily indexed by search engine. Title of a webpage should be effective and depicts what does the website contains.

C. **Using keywords:** Keywords in the webpage should not exceed thrice. It should be used in different styles: Italic, Bold and underlined. It is more useful to use *strong label* as compared to *bold label*. The most desirable density of keyword is within 5-7% and 7-8%. It is more appropriate approach to place keywords at page ends, page heads and paragraphs [13].

D. **Using title labels:** It is very easy for the search engines to find the title of 50-80 characters. The title label; should be included in the <head>label. Title name should be unique for each webpage.

E. **Selecting Domain field:** The domain name should be according to the keywords. It is important to keep the website name short and suitable for objectives. The use of special characters such as "_" and "-" should be minimum as it lowers the page rank.

F. **Fogging:** Few fraud methods are also determined by search engine and it is considered as "Spam". For example, keywords written on the background of the web page and keyword in white font color written on white background [14 [15].

G. **Choosing Description labels:** Whenever we choose a description, it should be typed in a sentence form that is of 150-155 characters. We can use an abstract label rather than description label because it describes the page content in a single sentence.

H. **Using Images:** To define the picture files we should use "alt" labels to make it easy for the web search engine to locate these pictures. Pictures names should also include related keywords. PNG picture format is used widely over the internet as it provides high quality and low size for pictures. Also search engine cannot read the text written on the images [16].

I. **Using frames:** Frames should not be used in the web pages because it creates many problems for indexing.

J. **Back link:** Back link is a link from some other website, web page known as referrer to that website (referent). Google uses link values while evaluating the page ranks for a web page , it also consider the content of the webpage , so it is important that webpage must have similar content with the page where the back link has been performed [17].

K. Site Maps: On Site Map, all the web pages of website must be linked to each other so that whenever a web user's encounter a problem they may take help from site map. For any search engine optimization to work efficiently web site must be designed in a high level language.

L. Website Navigation: In order to provide faster and useful site navigation, a good navigation structure must be developed. Web pages should not contain extensive content; images in a website should be optimized and transformed into a suitable format. Compression operations may also be applied on images [18].

2. PAGE RANK ALGORITHM

Google uses the algorithm known as page rank (PR) algorithm in order to match the given search string. This algorithm is used to make a sequence. Sequence depends on the Page Rank Algorithm. Heart of Google's searching software is Page Rank, a system for web pages developed by Larry Page and Sergey Brin at Stanford University. Google follow a famous page rank algorithm .Page rank algorithm is to make a sequence to rank pages from high priority to low priority. After every 15 minutes Google calculates page rank of your webpage .In starting every page rank of page starts from 1. Google doesn't rank the whole web site but it is determined for each web page individually. Website having large no. of hyperlinks is a stronger website [19]. Google depicts a link from Page A to Page B as a vote, by Page A, for Page B.
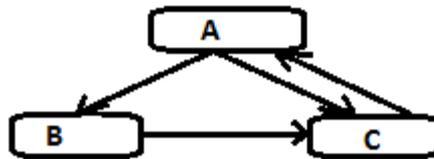

Fig 2. Linking between Web pages

Link from Page A to Page B- Page A votes for B
Link from Page A to Page C- Page A votes for C
Link from Page B to Page C- Page B votes for C
Link from Page C to Page A- Page C votes for A

In this example C is more important link here because two links are inwards here.

No. of outbound links from Page A = C (A) = 2
No. of outbound links from Page B = C (B) = 1
No. of Outbound links from Page C = C (C) = 1
To find out the page rank of any page, we use the formula: A+B

Where, A= Chances of directly going to Page through browser by writing address in address bar of any page
B= Chances of jumping to page through hyperlink (blue Color) in any page on web. By adding these two terms together, we get the page rank of the web page:

$$PR(A) = (1-d) + d \left(PR(I) / C(I) + \ldots\ldots\ldots + PR(n) / C(n) \right)$$

Where PR (A) = Page Rank of A
PR (I) = Page rank of pages I which has link to page A, n is no. of such inbound links on Page A
C (I) = No. of outbound links from Page I
d is a damping factor which can be set between 0 and 1 which is probability of going to next page through hyperlinks [20] [21].

3. CONCLUSION

High ranking in Search engine result page (SERP) can greatly enhance an organization's visibility. In this paper we focused on various parameters that effect rank of website/webpage. Many researches have been done on how to improve the page ranking.

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