

Search Engine Optimization

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ABSTRACT

Search engine optimization can be described as a cluster of strategies and techniques used to increase the amount of visitors to a website by obtaining a high-ranking placement in the search results page of a search engine (SERP). This review paper highlights different factors to be taken into consideration while performing SEO for a website.

So the primary goal of SEO is to increase the visitor traffic to your website and convert them to your potential customers.

Keywords: Search Engine Optimization (SEO), Dynamic web, Link Wheel structure, Search Engine Anatomy, On-page Optimization, Off-page Optimization.

1. Introduction

SEO is an organic method of making a search engine friendly website. SEO is a set of practices to make the website and its contents noteworthy and visible to both the search engines and the web users.

SEO helps increasing a website's visibility within the search engines. This can be achieved by displaying the website on the first or second page of search engine results page (SERPs)

When a website is rated within the first ten listings of a search engine it improves the volume of quality traffic to that web site from search engines and ensures a high return on investment (ROI) and global reach of the business.

Search Engine Optimization (SEO) is one of the most important aspects that most businesses should think

In this situation the relevance of Search Engine Optimization (SEO) comes into sight. SEO aims to make the e-business approachable to a good number of possible and existing customers, which will increase the revenue.

2. Concepts and Description

a. Page Rank

It is an algorithm used by Google, which assigns numerical weight to the URL of web documents to measure their relevance. Google had published their page rank formula which is stated below:

$$PR(A) = (1-d) + d(PR(t1)/C(t1) + \dots + PR(tn)/C(tn))$$

➤ $PR(A)$ -Page Rank of the page

➤ $1-d$ - d is a damping factor considered to be about 0.85

➤ $PR(t1)$ - $t1$ is the PR of the incoming link page

➤ $PR(tn)$ - is the Page Rank of all of the linking pages.

b. Crawler and Database

It is a program that sieves through text on websites to study the information contained in it.

On page Optimization

Updating the contents of our website and optimize 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.

c. Off page optimization

It mainly concentrates in creating back links & social media marketing.

d. Web directory

A web directory is a directory on the World Wide Web. It specializes in linking to other web sites and categorizing those links. Web directories allow site owners to directly submit their site for inclusion, and have editors review submissions for fitness

3. Search engine Anatomy[1]

There are four parts in a search engine, observed upon query insertion. The engine also indicates how many results it has fetched and in how much duration.

i. Non sponsored listing

These are the results from the listings that are done by Google crawlers according to their ranking algorithm.

Sponsored Listing

Sponsored listings are a set of results shown in the result page at the top most and the right corner.

Search box

This section is used by the user for his query; it may be from his country or from World Wide Web.

ii. Google instant

As one start typing his query in Google, it starts displaying result by analyzing each word.

4. Working of Search Engine[2]

Following are the various steps in the working of Search Engine.

a. Crawler

It is a program, which sieves through text on websites to the information contained in it. SEs visits the web or sieve through text on the web pages to see the information contained in it using the program named Spider or Crawler. The frequency of crawling is not predictable.

b. Indexing

Information about web pages are stored in an index database for use in later queries.

c. Processing

Search Engines do not examine the entire web when a user enters in a search query. SE simply gathers information according to the search words the user has entered.

d. Relevancy Calculation

The web pages are assigned certain weights based on page ranking algorithms. The algorithms use mathematical equations to rank them.

e. Retrieving the result

The search results are displayed, sorted from the most relevant to the least relevant sites, in page wise manner.

5. Method Proposed

The method proposed for performing SEO contains the following steps.

1. Search Engine Submission

- The first step is submitting the website's homepage. It should be done along with submission of a site map since it has direct links to the rest of the website. This will help search engines to find your complete website.[2]
- Place of Submission:
 - It is recommended to submit your home page to the major search engines individually, at least initially:
 - Submit to Google
 - Submit to Yahoo
 - Submit to MSN

2. Directory Submission

A web directory classifies links into categories and subcategories. After validation your link is listed in the directory. The search engine thereby acknowledges your presence in the directory than some other website.

6. Search Engine Optimization technique

The SEO techniques structure a website physically by enhancing its physical features and also monitor parameters external to the website which collectively affect the indexing of the website by search engines.

a. On Page Optimization

b. Off Page Optimization



Figure1: Figure showing the position of SEO techniques.

6.1 On page Optimization [1]



Figure2: Components of On page Optimization

On-page optimization consists of all the elements that can bring about an improvement in the search engine results by making changes on the webpage itself.

i. Title optimization

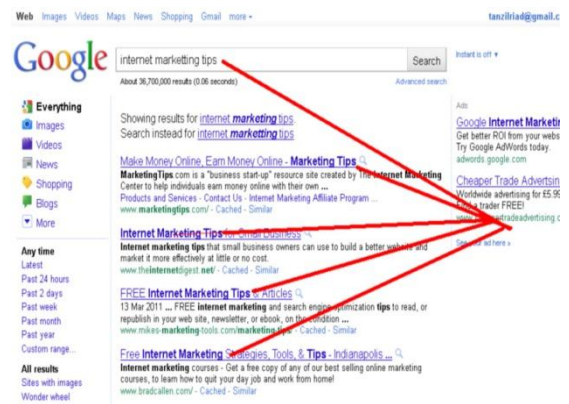


Figure 3: Use of relevant keyword in title tag

It is a piece of HTML keyword, which describes what is website all about to the search engine and users.

Word frequency

On an average we provide 500 to maximum of 800 of words on each page.

ii. Keyword density:

Frequency of keyword to be optimized must be 3%-5% on the pages with 500-700 words & 8%-10% on the pages with 700+keywords.

iii. Relevant keywords

Most important keywords of the users query must be used carefully specially on the top of page..

iv. Hyperlink

A hyperlink is a navigation element or reference of a document in the other part of the same document, or a specified section of another document, that automatically brings the referred information to the user when the navigation element is selected by the user. The search engines basically predict that if we are linking something from our page is closely related to our page.

v. Meta tags optimization

Meta tags are very useful in providing the search engine about the proper information of a website.

Sitemaps

Sitemap displays the structure of the website in a hierarchical way. It should always make two sitemaps, one for users and other for search engines and make the sites easier to navigate. Sitemaps designed for visitors help visitors if they have problems finding the pages on a site

vi. Hidden target keywords

These keywords are hidden from users but are visible to crawlers and help them to find web pages.

vii. Image optimization

Image search optimization techniques can be viewed as a subset of search engine optimization techniques that focuses on gaining high ranks on image search engine results.

6.2 Off page Optimization[5]

Off-Page optimization is the technique to improve the search engine rankings for keywords. It is used to build back links.



Figure 4: Figure showing off page optimization

i. Back-links generation

In this process we tend to increase the link of our website on other websites. Back links are the best way to increase the rank of a page/website and the best way to increase back links is link exchange or submitting the URL while doing online advertisements.

ii. Blog Posting

Blog Posting increases the visitor ratio.

iii. Social Networking

It is a process of sharing information on sites that facilitates content sharing, data exchange, adding unique content etc.

iv. Press Release

Optimizing a press release provides some additional lift to a web site when that press release is distributed and syndicated through other relevant industry or news sites.

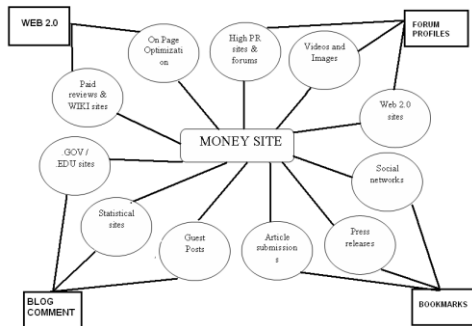
v. Video submission

Videos can be used in several ways to enhance search engine optimization only the thing is that the videos are relevant, informative and full of information.

- Techniques of video optimization:
- Give the video a good title that uses a related key phrase relevant to your product, service or brand.

- Use Video as a pathway to content on your site.
- Use video sitemap with the keywords in the anchor text links so that users and the search engine can find it.

7. Link wheel Structure for SEO[3]



a. Unique Content

Unique content is one of the prime factors which affect the indexing of a website. The more unique the content is, greater is the frequency of search engines crawler visiting your site and indexing its content.

b. Web 2.0 sites

Web 2.0 sites are the sites, which allows us to create blogs and to share them. Set up free blogs on sites like Xanga.com, Blogger.com or WordPress.com.

c. Forum Profiles

There is huge ranking power in the do-follow forum profiles. This can be done in favors of the money *Social Networks*

Clones of famous social sites with do follow links can be used to produce an online presence when auto post links are enabled

d. Press Release

News sites are fonder of free content.

e. GOV and .EDU links

Google considers these sites to be of high importance, thereby assign them extremely high Page Rank.

f. Blog Commenting

Blog commenting is the best way of getting natural back links to the site by posting relevant content or valuable suggestions in the comments as these comments tend to get approved by the authors of sites with high PR. Ten manual comments are fast better

than 100 automated comments.

g. Guest Post

In exchange for quality content, you can get free links. Real and blogs are in need of quality articles to their site.

h. Social Bookmarks

This is used to increase social signals, to make the content easy to share and to drive traffic to money site from targeted audience for ROI.

i. Article Submission

This refers to writing a relevant article about your business and submitting it on the article directories and includes a link or two pointing to the money site. Article should be unique keyword optimized one with around 500-700 word and sub headings, bullets etc.

j. High Page Rank back links

This refers to getting links from high authority pages that are reputed with huge domain age, high SEO features and Page Rank.

k. Domain with age or keyword in it

There are thousands of websites that are expiring each day. Using a few automated software, find the domains, which have expired and have natural links from other sites in your niche.

l. Anchor Text

65% Keywords, 10% Click here 5% Read more, 10% Source and 1.

m. On page Optimization

Title Optimization can be done by including relevant keywords in the title of the website. Meta Tags Optimization can be given by describing the selling point and what information that page offers. Use keywords that are targeted in Meta tags.. Image Optimization can be implemented using alt text, file name image title and image linking.

8. SEO in Web application

A web application is characterized into 2 categories based on the content it holds. Depending on this content it is categorized as static or a dynamic web application.

a. Static Website

A static website can be thought of as an online brochure. It acts and feels like a printed brochure you can view through your computer screen.

- **Dynamic Website:** Websites that utilize databases, which can insert content into a webpage by way of a dynamic script like PHP or JavaScript, are as considered dynamic.
- It is less time consuming in comparison to static websites and can be done easily without much technical support.

b. Dynamic URL

A dynamic URL is the one which is a result of a search within a website driven by a database running on some script. When a site's database is queried it results in generation of a dynamic URL.

8.1 Static Vs. Dynamic

- Static URLs are generally ranked fairer in search engine results, primarily because they are indexed faster than dynamic URLs.
- Dynamic pages generally do not have keywords embedded in URLs, while it is strongly recommended to have URLs, which are rich in keywords.
- Dynamic URLs are less friendly to search engines.
- The table given below summarizes the advantages and disadvantages of using static URLs opposite to dynamic URLs in context of SEO.

Solution to the Dynamic URL problem

1. URL Redirect

Redirection is the process of forwarding one URL to a different URL. A redirect is a way to send both users and search engines to a different URL from the one they originally requested. Below are descriptions of some of the commonly used types of redirects.

- Types of Redirects

i. 301 Moved permanently

A 301 redirect is a permanent redirect, which passes between 90-99% of ranking power to the redirected page. It is the best method for implementing redirects on a website.

ii. 302 found (HTTP 1.1)/ Moved Temporarily (HTTP 1.0)

It is a temporary redirect. It passes 0% of ranking power and in most cases should not be used.

iii. 307 Moved Temporarily(HTTP 1.1 Only)

This redirect is the HTTP 1.1 successor of the 302 redirect. While major crawlers will treat it like a 302 in some cases, it is best to use a 301 in most cases.

iv. Meta Refresh

Meta refreshes are a type redirect executed on the page level rather than server level and not recommended for SEO technique

2. URL Rewriting

URL rewriting is masking the dynamic URLs with static ones. This means that the URLs that previously contained query strings with elements such as “?”, “+”, “&”, “=”, or “%” will contain the more search engine friendly “/” (slash) element and present themselves in a simplified form.

Example

Dynamic URL (Before Writing):

<http://www.companyname.com/products/items.php?id=x&model=y&variety=z>

Static URL (After Writing):

<http://www.compantname.com/x/y/z.html>

9. Dynamic Content and SEO

SEO for dynamic content poses a few significant challenges.:

9.1 Challenges for Optimizing Dynamic Content

- a. A Dynamic URL

A Dynamic URL is an address of a dynamic web page. Dynamic URLs are fairly cryptic in their appearance.

b. Login and other forms:

Login forms can restrict access to pages not only to users, but also search engines.

Cookies:

Web cookies are small bits of data that are stored Pages that require cookies can block spiders because spiders don't store cookies as web browsers do.

Hidden pages:

Sometimes, pages on a website are hidden from search engines because they're buried too deep in a site's architecture. For example, a page more than three clicks deep from the home page of a website may not be crawled without an XML sitemap.

d. JavaScript:

Search engines don't index content that requires full-featured JavaScript. Text that is created using JavaScript will only be accessible with JavaScript enabled, will not be indexed.

9.2 Optimization of Dynamic Content [4]

a. Creating static URLs

Dynamic URLs, especially dynamic URLs with vague names, can be a turnoff to searchers. In order to have friendly URLs, you want to rewrite your dynamic URLs as static URLs. Blogs powered by wordpress or Blogger make it easy to convert dynamic links to static links.

b. Optimizing content hidden by forms

If you want your form's hidden content to be indexed, make sure to give access to it in ways other than through a form alone. If you have content that you want indexed hidden in a login-only area, consider taking that content out of the

restricted area so it can be indexed.

10. Conclusion

Internet has become a vital part of our day-to-day lives.. SEO helps customers in locating the business easier and faster with less effort. Various techniques have been proposed to perform the search engine optimization. These techniques are straightforward and demand low maintenance. Most of them are cost effective too. Thus websites can improve their page rankings and consequents increase their sales by employing search engine optimization techniques.

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