

Search engine optimization with Google

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Abstract

Search engine optimization is a strategical technique to take a web document in top search results of a search engine. Online presence of an organisation is not only an easy way to reach among the target users but it may be profitable too if optimization is done keeping in view of the target users as of the reason that most of the time users search out with the keywords of their use (Say; PhD in web technology) rather than searching the organisation name, and if the page link comes in the top positions then the page may be profitable. This work describes the tweaks of taking the page on top position in Google by increasing the Page rank which may result in the improved visibility and profitable deal for an organisation. Google is most user friendly search engine proved for the Indian users which give user oriented results .In addition, most of other search engines use Google search patterns so we have concentrated on it. So, if a page is optimised in Google it is optimised for most of the search engines.

Keywords: Search engine optimisation, SEO, Google optimisation, On page optimisation, Off page optimisation, Image optimisation, URL structure optimisation.

1. Introduction

Users use search engines for most of their queries but they only prefer the results available on first page and 2-3% of users go on further pages (except Researchers), Now imagine if the page of an organisation is on 2-3rd or 4th page then the business which can be generated from that page has a very less change to return and user will prefer the page coming on the 1st page. Trillions of web pages are indexed per day in a search engine.

There are millions of search per day .Most of the visitor's visit the website by hitting the links available in search engines and believe that companies found on the top results are the best brand in their product service and category. These clues make it very

clear that if an organisation wants to go on top in their sales then they should concentrate in getting their page widely available in the search engines. For example, if someone wants to use cab services and unknown to the place where he is now, normally if he/she is a techie search of for cab services with the name of city and hit the top 10 links and use their services. There are so many business of online booking system of tickets are growing these days and getting a very good response in very short span of time; in this particular case its very necessary to be on top results of a search engine so that the customers can easily be fetched out.

2. Description

2.1 Search engine optimization

It is the way of increasing the visibility of a page by natural means i.e., unpaid search results. In this process the website undergoes redevelopment to make our keywords effectively communicate with major search engines. This work is done by SEO (Search engine optimizers), They may target image search, academic search, local search, video search. Optimising a page involves editing contents & HTML codes in order to increase its relevance to specific keywords and proper indexing in search engines .The contents and codings are edited keeping in view of the indexing pattern of the search engines which are done by a crawler named Googlebot in Google. It is the most powerful way to reach to reach the customer as we meet them when they are in need. Most of the users find the target websites during their search.



Figure.1 Search engine optimisation

2.2 Page Rank

It is an algorithm used by Google which assigns numerical weight to the URL of web documents to measure its relevance. The numerical weight that it assigns to any given element E is referred to as the PageRank of E and denoted by $PR(E)$ [1]. Stanford University is the birthplace of PageRank when Larry Page (hence the name *Page-Rank*) and Sergey Brin were involved in research of a new kind of search engine. The idea of Sergey Brin was that information on the web could be ordered in a hierarchy by "link popularity": a page is ranked higher as there are more links to it. In 1998, the first paper describing the PageRank and initial prototype was published after which Page and Brin founded Google Inc., the company which is behind the Google search engine. It shows the popularity or a particular link or a website. The page with higher rank gives more optimised results.

$$PR(A) = (1-d) + d (PR(T1)/C(T1) + \dots + PR(Tn)/C(Tn)) \quad [2]$$

The name "PageRank" is a trademark of Google, and the process has been patented (U.S. Patent 6,285,999). The said patent is of Stanford University to which Google has exclusive license rights. The university received 1.8 million shares of Google in exchange for use of the patent; the shares were sold in 2005 for \$336 million [3].

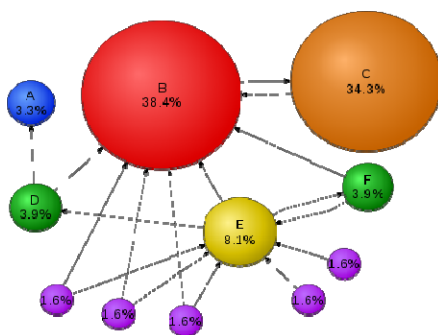


Figure 2: Page ranking in Google

2.3 Crawlers & Database

It is a computer programme which browses the World Wide Web in a methodical, automated manner or in a orderly fashion. It normally visits the URL'S of our website [4].

Google	Googlebot
MSN	MSNbot
Yahoo	Yahoo Slurp

Table1: Search engines and their crawlers

2.4 Onpage optimisation

It is the first step which every webmaster should concentrate, this deals with the changes we do in our page in order to improve visibility and rank. On Page Optimisation is optimising your website in a way that it can rank better in search engines and improve visitor satisfaction. This optimisation technique depends on nature and business of our website. It is advisable to update the contents of our website and optimise 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, robots.txt, sitemaps, Image optimization etc which requires extensive research with the competitor webpages. If proper Onpage optimisation is done, results in drastic increase in the rank and readability of the website[5].

2.5 Off page optimisation

This is the work which is done apart from the website to improve the visibility & ranking of a page. Off page search engine optimization is supposedly the complement of On Page Optimization. It mainly concentrates in creating backlinks & social media marketing. It is very novel practice to have links from a webpage which has good rank and visibility. It is the best technique to go ahead of the competitors if the webmaster team is equipped with quality of web researchers. In brief it consists of various link building methods like Blog posting, Social networking, Press release, Video submission, link exchange, Article submission etc [6].



Figure 3: Figure showing off page optimisation [7]

2.6 Search engine Anatomy

There are four parts in a search engine is observed when a query is done, we may call them as the part of search results. The engine also indicates how many results it has fetched and in how much duration.

2.6.1 Non sponsored listing

These are the results from the listings that are done by Google crawlers according to their ranking algorithm. For these listing we need not to pay anything to Google, The pages are ranked according their quality.

2.6.2 Sponsored Listing

These results are also shown in the result page at the top most and the right corner, for these listing we need to pay to Google.

2.6.3 Search box

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

2.6.4 Google instant

As we start typing out our query in Google, it starts displaying our result analysing each word. This feature depends on the speed of connection, many a times it doesn't work on slow connection.

3. Methodology

3.1 On Page Optimisation

3.1.1 Title optimisation

It is a piece of HTML keyword which describes what is website all about to the search engine and users, it is the most important part of a website which is used by search engines to find the relevance of a website. This is the structure how it looks link in coding part. It is advised to use the most relevant keywords in the title tag which describes the website [8].

```
<head>  
<title>SEO India - search engine optimization India, seo  
services, seo company India, affordable seo India  
Chandigarh </title> </head>
```

Following screenshot shows how search engine gives it relevance when fetching out user query.



Figure 4: Figure showing title optimisation

3.1.2 Body text

Contents are the success key for ranking in search engines, so it's important to concentrate on the contents of the website which help contents to be considered by the search engine crawlers at the time of assigning the rankings. Following tweaks have been implemented on our project: -

- 1) Use of heading tags.
- 2) Word frequency: -On an average we had provided 500 to maximum of 800 of words on each page.
- 3) Keyword density: -Frequency of keyword to be optimised was kept 3%-5% on the pages with 500-700 words & 8%-10% on the pages with 700+ keywords.
- 4) Relevant keywords: -Most important keywords of the users query were used carefully specially on the top of page. In general the keywords appearing on the top of a page or top area are most prominent for indexing by the crawler.

3.1.3 Hyperlinks

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; In brief it makes the contents user-friendly if seen from the search engine point of view. Snapshot of a hyperlink is shown below.

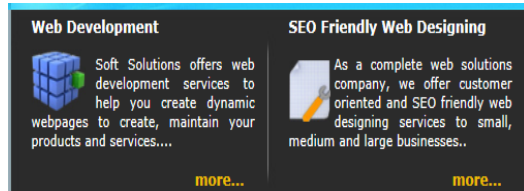


Figure 5: Figure showing hyperlinks

All the words more... are hyperlinks to get detailed information about the respective section.

3.1.4 URL

We should improve the structure of url's by using words as simple to understand URL'S will convey content information easily. If our URL'S contain relevant keywords, it provides users and search engine with more information about the page than an ID or oddly named parameter would as the URL to a document is displayed in the search results after the title.

3.1.5 Quality and easy to understand contents

Creating and using useful contents increase the influence of a page more than all the tweaks. This tweak is very important in the sense that if a user likes the content then he/she shares it happily via blog, email, forums or other means. We should think from user point of view whether what he searches out to find his contents in a search engine, in addition to it we should create a new and fresh contents ,useful service that no other site offers. Content should be written in a manner that user enjoys the content and it is easy to follow and it should be created in view of users not search engines.

3.1.6 Meta Tags optimisation

Meta tags are very useful in providing the search engine about the proper information of a website. Below a complete metatag used by us is shown. Out of all meta tags description tag is most important as it is a part of search results and if the optimisation keywords are provided here properly results with very nice result.

```
<meta name="description" content="BDRC is most trusted Life Science Organisation reco  
operate from Hyderabad Secunderabad Lucknow Bhubaneshwar">  
  
<meta name="keywords" content="Biotechnology Training,Bioinformatics Training ,DNA Te  
<meta name="google-site-verification" content="UUwivXTo0yQeaxXoGemqsiSszumm3Jd653nHd6l  
<meta name="language" content="ENGLISH">  
<meta name="product_brand_name" content="BioAxis DNA Research Centre">  
<meta name="product_family" content="Internet">  
<meta name="region" content="GLOBAL">  
<meta name="distribution" content="Global">  
<meta name="revisit-after" content="15 days">  
<meta name="abstract" content="www.dnares.in">  
<meta name="copyright" content="BioAxis DNA Research Centre,2007-2010">  
<meta name="author" content="BioAxis DNA Research Centre">  
<meta name="robots" content="All">  
<meta name="rating" content="General">
```

Fig 8: Figure showing Meta tag optimisation

3.1.7 Newsletters

Many a times when a user visits a website and wants to be updated with updated of the company to which the website belong ,In this case newsletter are the best options ;In this the users provides his/her email-id over there & if there any update comes over the page it is sent automatically sent to the users inbox.

3.1.8 robots.txt

This file is used on the files of our website whom we want should not be accessed by the crawler; it is kept in the root directory of the website. If we have some subdomain of our website and want its access to be limited by the web crawler then by creating a robots.txt file for this we may prevent its access to the crawler.

3.1.9 Sitemaps

This is a simple page in our website containing the listing of the pages on our site, which displays the structure of our website in a hierarchical way. We 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 & the sitemaps designed for search engines makes it easier for search engines to discover the pages of a site.

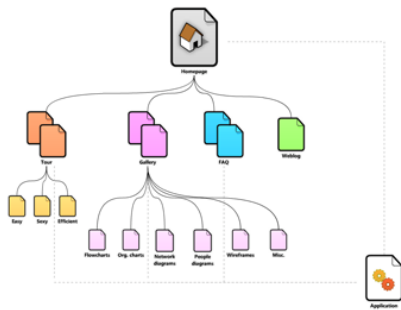


Figure 9: General purpose sitemap

Site map		
Top:	Card category:	Special features:
<ul style="list-style-type: none"> • News • About this site • Privacy policy 	<ul style="list-style-type: none"> • By team • By players • By year • By price 	<ul style="list-style-type: none"> • Card exchange • Bargain pack • Holiday gifts

```

<?xml version="1.0" encoding="UTF-8"?>
<urlset xmlns="http://www.sitemaps.org/schemas/sitemap/0.9">
  <url>
    <loc>http://www.brandonsbaseballcards.com/</loc>
    <changefreq>daily</changefreq>
    <priority>0.8</priority>
  </url>
  <url>
    <loc>http://www.brandonsbaseballcards.com/news/</loc>
  </url>
  <url>
    <loc>http://www.brandonsbaseballcards.com/news/2008/</loc>
  </url>
  <url>
    <loc>http://www.brandonsbaseballcards.com/news/2009/</loc>
  </url>
  <url>
    <loc>http://www.brandonsbaseballcards.com/news/2010/</loc>
  </url>
</urlset>
    
```

Figure 10: Examples of an HTML site map & XML sitemap. An HTML site map helps users easily find content which they are looking for, and an XML site map helps search engines in finding pages on our site.

3.1.10 Hidden target keywords

In this technique we wrote the keywords on the pages by using hyperlinks with other pages full of keywords. Which were being optimised? Keywords which matching colours of the page so that it seems to be invisible to the users were used, These keywords remained from users but it worked a lot as it was accessed by the crawlers.

3.1.11 Image optimization

In this technique when optimising a page with targeted keywords we should name the image with the targeted keyword name, it has also a good impact in optimisation. 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.

4. Off Page optimisation

4.1 Backlinks generation

In this process we tend to increase the link of our website on other websites. According to search engines if a page has more and more number of backlinks means there is something relevant in a page because of which other pages are providing links to it, Backlinks are the best way to increase the rank of a page/website and the best way to increase backlinks is link exchange or submitting the URL while doing online advertisements[9].

4.2 Blog posting

It is always a good practice to be on a blog like Blogspot,wordpress,thoughts ,linkorbits etc.According to a survey it has been found that companies having blogs are 55% more visitors,97% more inbound links,434% more indexed pages[10].

4.3 Social networking

It is the latest technique to have better brand visibility. It is a process sharing information on sites that facilitates content sharing, data exchange, adding unique content etc.Different social media tools includes blogs, podcasts and community based web portals such as Facebook, MySpace, LinkedIn, Twitter, Digg, Reddit etc.These social media tools come with different features like text, images, audio & video sharing among users contents.Following are the benefits of social networking sites: -

- 1) It generates free website traffic
- 2) It boosts up the brand visibility
- 3) It generates inbound links

4.4 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. We shouldn't miss the opportunity to generate valuable backlinks back to our site, driving up our rank and increasing the authority of our site with search engines[11]

4.5 Video submission

Videos can be used in several ways to enhance search engine optimisation only the thing is that the videos are

relevant, informative and full of informations. Step by step videos which concentrate on the procedures are best considered. Some of the tricks for video optimisation is given below: -

- 1) Give the video a good title that uses a related key phrase relevant to your product, service or brand.
- 2) Use Video as a pathway to content on your site. Upload videos to YouTube and provide links back to your site.
- 3) Optimize the video for important key phrases using Tags with these terms including even the name of your video.
- 4) Use classic content on the page around your videos with can be indexed by the search engines.
- 5) Keep the videos preferably under 5 minutes but shorter is even better.
- 6) Use a video sitemap with the keywords in the anchor text links so that users and the search engine can find it.
- 7) Tag the videos with key phrases that are relevant to your content.
- 8) Make sure about logo in the video as it will generate brand awareness with your viewers.
- 9) Use the 'Embed Option' when uploading the videos as it allows other users to post the video on their sites/blogs.
- 10) Use descriptive Meta data with relevant keywords and include a keyword rich description of the video.
- 11) Let users rate the video as those with higher ratings tend to be bookmarked and also sent to friends more
- 12) Submit the video using RSS

There are several ways you can now use your videos to enhance your SEO. You need to make sure videos are relevant and informative, providing useful information. Videos that show step by step procedures are excellent as are videos that provide an opinion about a specific topic

4.6 Article submission

Article submission has same impact as of Blog promotion and press release submission.

4.7 Reputation management



Fig 11: Reputation management in search engine optimisation

Search engine reputation management helps to move out of the first result pages those negative posts. It can help to bring back the good name, it helps in keeping business reputation preserved and protected. Each and every corner of the website is monitors and effective measures to protect a good reputation are taken. In brief this service takes effective measures to protect a good reputation and prevents other to damage the reputation.

5. Tools Used[12]

5.1 Google webmaster tool

Google Webmaster Tools is a no-charge web service by Google for webmasters. It allows webmasters to check indexing status and optimize visibility of their websites. It has tools that let the webmasters:

- 1) Submit and check a sitemap
- 2) Check and set the crawl rate, and view statistics about how Googlebot accesses a particular site
- 3) Generate and check a robots.txt file. It also helps to discover pages that are blocked in robots.txt by chance.
- 4) List internal and external pages that link to the site
- 5) See what keyword searches on Google led to the site being listed in the SERPs, and the click through rates of such listings
- 6) View statistics about how Google indexes the site, and if it found any errors while doing it
- 7) Set a preferred domain (e.g. prefer example.com over www .example.com or vice versa), which determines how the site URL is displayed in SERPs.

5.2 Meta Tag analyser tool

Following are the uses of Meta Tag analyser tool

- 1) See how search engine robots analyze your or your competitors web site
- 2) Receive tips on how to improve your Meta Tags
- 3) Check the keywords used on the page and find the keyword density

- 4) Check web server operating system where site is hosted
- 5) Check website load time
- 6) Check website file size
- 7) Check URLs and links found on the page

5.3 Link popularity check tool

Popularity of a website is checked using this tool. This tool shows how many other sites are linking to the site. Most search engines use this data to calculate how popular your website is. The more links to our site, the better the search engine rankings will be. We can even provide some competitors' URLs to compare our site to theirs.

5.4 Sitemap submission tool

This tool is helpful in submitting sitemap to various search engines.

5.5 Keyword suggestion tool

This tool suggests keywords related to our keyword which can be used while doing optimisation.

5.6 Keyword Traffic estimator

This tool shows us approximately how many daily searches our keywords would get. This tool is used to research the best keywords for our website.

5.7 SEO dictionary

It is the list of SEO related keywords with their definitions.

5.8 Page rank checker

This tool is used to check the rank of the page so that further actions can be taken to improve the rank of a page.

5.9 Page snooper

This tool is used to see the source code of any online site to see the exact structure of the website.

5.10 Broken link checker

This tool checks the outgoing links on the page to see if they are broken.

5.11 Link counter

This tool counts the number of outgoing links or URL's on a given page and display results. This tool could be useful for link exchange purposes, as we should not trade links with pages with too many outgoing links. It is recommended not to trade links with pages that have over 50 links.

5.12 Reciprocal link counter

This tool checks if any given list of sites are linking to your website. It is a great tool to keep track of the reciprocal links to make sure your partner has not removed the link, without visiting their page. You can put up to 100 URL's of sites that you would like to check.

6. Conclusions

This paper proposed the novel methods or search engine optimisation for driving more and more users to a website. We used the methods continuously for 24 weeks and discovered more and more users accessing our project website. The rank of the website was raised from 1 to 4; In addition to it sub links were assigned by Google which is assigned to a website which has more number of users according to Google. As a future work we would to develop tools which can add a site to a search engine whenever user wants and can remove the sites which are not good for Mankind. Our project can be visited on <http://www.dnares.in>.

5.1 SEO impact Percentage

1	Title	90%
2	Backlinks	75%
3	Domain and file names	75%
4	Description Tags	66%
5	Image optimisation	65%

Table2: Impact of various factors according to SEO point of view.



Figure 12: Figure showing SEO impact percentage

5.1.1 Factors of Seo ranking[13]

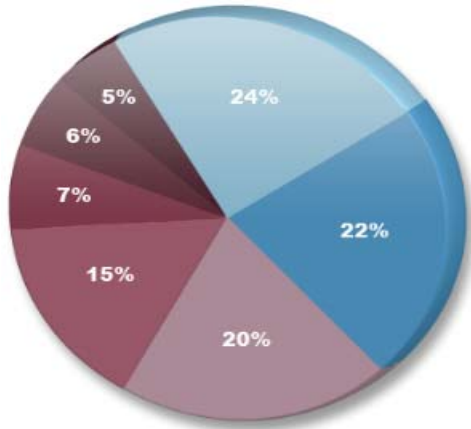


Figure 13: Factors effecting SEO ranking

1. 24% Trust/Authority of the Host Domain
2. 22% Link Popularity of the Specific Page
3. 20% Anchor Text of External Links to the Page
4. 15% On-Page Keyword Usage
5. 7% Visitor/Traffic & Click-Through Data
6. 6% Social Graph Metrics
7. 5% Registration & Hosting Data

7. Biography



Vinit kumar gunjan has completed his B.Tech degree in computer science from Trinity university in 2009. He is pursuing M.Tech in computer science from Sharda university, Greater Noida, Uttar Pradesh, India. His research interest includes Biological (DNA) development, Network & internet security Computing.

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Dr. Amit Kumar is CEO and Chief Scientific Officer of BioAxis DNA Research Centre (BDRC) Pvt Ltd and Secretary, IEEE Hyderabad Section. Dr Amit Kumar is a member of IEEE, ISCB, APBIONET, IIR and PRIB. He obtained his PhD in Applied Bioinformatics in 2007. Dr Kumar was nominated as “Pioneers in Genomic education 2010” by Ocimum Biosolutions Hyderabad and Gene Logic USA. He has organized, chaired and given invited talks in several National and International Conferences like PRIB 2007 Singapore, PRIB 2008 Australia, WCCI 2010 Barcelona Spain, DNA 2009 Andhra Pradesh Police academy and DNA 2010- Osmania University and several IEEE events etc.



Dr Allam Appa Rao, Vice-Chancellor of the JNTU Kakinada, is an iconic and towering personality in the field of education and research. His contributions to the field of Computer Engineering have been exemplary and spilled over into numerous other areas of science and technology, making him a pioneer of scientific advancements meant for the benefit of society. Dr Allam Appa Rao began his career in 1969 and went on to complete his Ph. D in Computer Engineering from Andhra University in the year 1984. This is the first Ph. D in Computer Engineering from Andhra University.

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