

SEARCH ENGINE OPTIMIZATION TECHNIQUES TO GET HIGH SCORE IN SERP'S USING RECOMMENDED GUIDELINES

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ABSTRACT: Search Engine Optimization (SEO) is a marketing discipline focused on growing visibility in organic (non-paid) search engine results which encompasses both the technical and creative elements required to improve rankings, drive traffic and increase awareness among search engines. Google has recently focused on On-Page SEO strategies, where unique quality content with natural link building are key factor to get good score in major search engines. This article aims to address general questions while writing web content, picking quality keywords and the techniques which boost ranking of a webpage in Google and other popular search engines. Main focus is on the On-Page SEO techniques that are ignored mostly by bloggers and web developers.

Keywords: SEO, keywords density, keywords optimization, On-page SEO, link optimization.

1. INTRODUCTION

Search engine is a software program that helps Internet users to find specific information and contents on the World Wide Web (WWW) [11]. With increasing dependencies on Web and expansion of the Internet, search engines are the key factor for extracting the right information at the time of need. Today, hundreds of different search engines exist, having distinct abilities and features. Google, Yahoo, Ask, MSN and Bing are the popular search engines [4]. In particular, Google has become an essential link between Internet users and the information they want to seek online. For this reason, any webmaster, blogger and engineer should actively learn and encompass the designing and marketing techniques to attract visitors to their websites.

The search engine marketing firm iProspect [16] pointed out that more than 60% users preferred to click on the results that appeared on the first page of Search Engine Result Pages (SERP's), while 40% users continued their search by changing the keyword and/or the search engine itself. Furthermore, 90% users visited the result pages and are satisfied from the respective search engines' performance. Besides, 5% users do not go beyond second page and only 2% consumers visited beyond third page [1]. Another study conducted by Zhu and Wu [27] found that "more than 80% of first visits to a website comes from web search". Among these visits more than 76% use Google worldwide. Therefore, getting top positions in SERP is critical for the constant flow of users to the websites and this is where the role of SEO comes into play.

SEO is the process of optimizing a website to achieve high rankings in major SERP's [28]. According to Jansen and Spink [9], there is a need to clearly understand emerging trends in web searching over different global regions and between various web search engines in order to design better searching systems. Concept of SEO was initially proposed by Sullivan [18] and is evolving since then. From the appearance of Yahoo to Google and with the emergence of SEO techniques and theory, search engine perfection techniques are in a continuous process of evolution. In Search Engine Marketing (SEM), SEO techniques can be used primarily to increase the ranking of a website that may lead to web domination [13, 14]. As the Internet is growing continuously, SEO techniques have become essential and so

is the increased research of SEO techniques. Enterprises, webmasters and web content creators are adopting the SEO based methods in order to make their website and development more suitable for the basic principles of information retrieval [17].

With the increasing dependency of people on search engine services, comprehensive and accurate knowledge on SEO techniques will become essential for anyone who depends on the Internet. In this article, On-Page SEO tactics are discussed that will help webmasters and blog developers to get high rankings for their websites in search engine results. Killroan [15] in his tutorial demonstrates that how SEO techniques can be used to increase the visibility of websites. Additionally, author addressed two general questions: (i) Factors that contribute to search engine rankings and (ii) What webmasters and web content developers can do such that users can find their content and websites easier using search engine.

Other than existing SEO techniques, this article evaluates top secrets of major search engine such as Google regarding positions in query log. We have considered most demanded points and effective strategies are highlighted in order to score good results in popular search engines. Furthermore, main focus is on Google search engine and providing lessons that enterprises and webmasters can readily implement without specialized technical know-how and a web marketing budget. This work will help business owners, web developers and SEO engineers to further expand their knowledge on the ethical application of SEO techniques in order to improve their websites relevancy which can lead to higher rankings in SERP's. Moreover, this work will be of interest to Internet users as it offers basic guidelines for improving website visibility in search engines, particularly for those who are interested in creating their own websites. Rest of the article is organized as follows. Section 2 defines search-related terminology and describes how the literature for article was selected. Important approaches and techniques that are used in SEO are discussed in Section 3. Finally, in Section 4, article is concluded with some remarks.

2. SEARCH-RELATED TERMINOLOGY

Search engine works like a system which continuously crawls information from different online sources. Whenever a user requests specific information from this system, he/she simply types in the query and search engine provides specific information sources against the said query. Search engine is mainly composed of four parts: crawler, indexer, database, and graphical user interface [19]. An excellent search engine should have the following four characteristics: rapid, accurate, easy to use and strong [20]. Search engines also offer a common interaction for web users, search marketing practitioners, researchers, and of course the search engine companies themselves. SERP displays a list of webpages based on the user's search query [15]. SERP normally includes a list of webpages with titles, a link to the page along-with a short description that shows where the keywords entered by user matches with the contents of the page. Users that have used more than one search engine would have noticed that competing SERP's show different website rankings for a given query, an observation highlighted by researchers in [5, 29, 30]. Most distinctive and successful feature of Google search engine algorithm is PageRank, introduced by Sergey and Page [6]. PageRank is used to measure the popularity of a webpage, where popularity is determined by the hyperlinks from other pages leading to it as well as of the linking pages themselves.

SEO methods are divided into two main parts: On-page optimization and Off-page optimization. On-page optimization refers to elements of website which comprises of a web page, such as HTML code, textual content and images. Off-page optimization refers to back-links (such as links which point to the website that is being optimized) [1, 2]. In SEO, white hat SEO refers to those techniques and methods that follow search engine rules and regulations. These techniques are also called ethical SEO and have the capability to give long lasting results for a website. On the other hand, black hat SEO refers to those techniques which are used to manipulate the search engine algorithm in order to gain high rankings. It is to be noted that these unethical techniques are not approved by search engine and using black hat techniques can cause the blacklisting of a site from the search engine database index altogether [3, 15].

SEM is another way of marketing that involves the promotion of websites by increasing their visibility in SERP's through optimization and advertising. SEO relies on the organic results listing of related pages which search engine crawled and ranked them according to content weightage. Organic search results are generated directly from the search engine ranking algorithm on the basis of search query relevancy. Mostly, search engines lists up-to ten pages in a single page, where pages with top ranking usually have high quality content and increase click through rate (CTR). CTR is the total number of clicks a webpage received whenever it appears in SERP's.

In this article, those SEO strategies and tactics are discussed and proposed that most webmasters, bloggers and web developers are not aware of while making their online business on early stages. Similar to Killoran [15], this article

mainly focuses on the following subset of SEO strategies and tactics:

- Helpful for all types of websites, especially for most searched content such as sports, movies, and health related websites;
- Applicable to a wide range of websites, as opposed to sites requiring specialized search functionality;
- Free, as opposed to paid search options such as Google AdWords;
- Ethical, as opposed to the deceptive tactics used by spammers.

Furthermore, this article draws its SEO lessons from the literature distributed by these three classes:

1. Published advice from search engine companies;
2. Empirical studies from the research community;
3. Much experience-based collective wisdom and occasional empirical studies from SEO practitioners.

3. SEO TECHNIQUES

As an advertising technique to build a site's positioning, SEO considers user interests. After referring to the methods adopted by previous relevant studies, SEO techniques are observed from four aspects: structure optimization, keywords optimization, content optimization and link optimization [2]. Along with four mentioned aspects, we choose some other factors which are very crucial for online business. These aspects are discussed next.

3.1. Review of Site Content and Structure

Most search engines now focus on the content of website, which consists of following three components:

- a) Quality of content;
- b) Content is unique, easy to read and understand;
- c) Grammar must be correct. There must be a comprehensive style to guide what is coming next.

The main goal of SEO is to construct and place the contents of a website in a way acceptable to user, such that likelihood of the page increases. If a web developer or blogger is constructing a webpage, he/she should explain the product from a user's perspective keeping in view the minute details that the visitor may experience. For instance, draw attention to the offers by a website; narrate a story highlighting the growth of the company based on earlier records and future trends, etc. Use of interesting quotes to keep the visitor's interest alive so that he/she stays on the page is another approach. Though, the development is generally thought of as a technical task, the developer should place text in a way acceptable to users rather than search engines. Focus should be on such contents that will engage users in their website; otherwise user will leave the website.

Similarly, the structure of the website on the other hand is very important and has numerous effects on SEO. Web developers and bloggers should link top pages from he main navigation. Every category page must have a link from home page, though it is not a hard and fast rule but can be treated as a general rule of thumb while keeping the navigating visitor in mind who does not have the whole sitemap in view. This will help spiders to rank pages in SERP's. It should be kept in mind that depth of link must be less than 4, e.g if *home* page gives link to *contact us* page,

its depth is 1. Navigation plan for websites is shown in Figure 1.

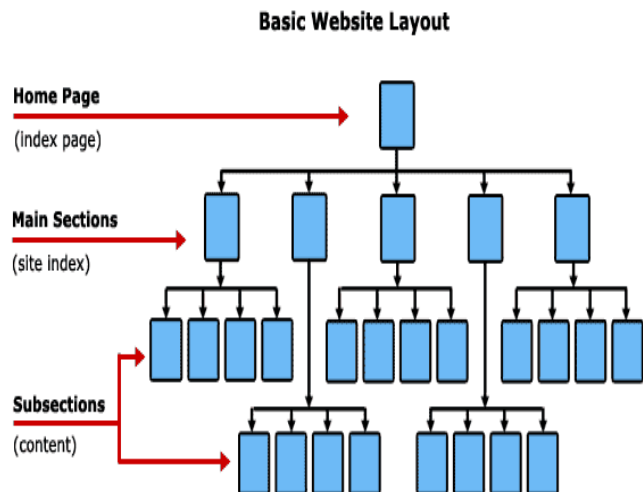


Figure 1. Navigational plan while creating website link structure

3.2. On-Page SEO Tactics

Google has revealed that speed of site is now main signal for top ranking, for this most of site penalized due to poor performance in Google speed test [7]. Google and other search engines focused on following aspects:

1. Remove render blocking JavaScript in above the fold-content, Minify JavaScript (JS);
2. Optimize CSS delivery in above the fold-content;
3. Minify HTML
 - Insert structure data markup;
 - Optimize images;
 - Mobile responsive webpages;
 - Browser caching;
 - Reduce server response time.

3.2.1. Minify JavaScript

Minify JavaScript (JS) refers to removing unnecessary spaces, comments and functions which are not used. This will compress JS, CSS and HTML to load page faster. Most search engines recommend not using JS above the fold; the 'fold' is where the bottom of the screen is on page load. Usually first appearance on a website before scrolling down is 'above the fold'. Anything which needs to scroll down to be visible is called 'below the fold'. External scripts must be fetched before they can be executed. Recommended snippet is listed in Table 1. JS that are necessary to render page content must be in line while remaining script can be separated on external file to give extra SEO score. If JS is too small and it is necessary to include it in the file, then follow search engine recommended pattern listed in Table 2.

Table 1. Above the fold

Avoid snippets	Recommended snippet
<pre><HTML> <head> <script src="external. js" type="text/jav ascript"></scr ipt> </head> <body>Content Area</body></pre>	<pre><HTML> <head> </head> <body> Content Area <script src="extern al.js" type="text/ javascript" ></script> </body></pre>

Table 2. Inline JS

Avoid snippets	Recommended snippet
<pre><HTML> <head> <script src="external.j s" type="text/java script"></scrip t> </head> <body>Content Area</body></pre>	<pre><HTML> <head> /*Content of small JavaScript here*/ </head> <body>Conte nt Area</body></pre>

Inline JavaScript will increase page speed, remove external request to external.js but doing this will also increase page HTML size. Most search engines preferred to reduce JS file size as well using JS Compression [21] tool available online. For performance, include only those JavaScript, which make too many requests. Another point in handling of JavaScript is to make JS file asynchronous putting extra attribute while calling external file. Table 3 has recommended snippet for asynchronous JS.

Table 3. Asynchronous JS

<pre><script sync src="example.js" type="text/javascript"></script</pre>

3.2.2. Minify CSS

Giving exact view of online webpages browser first renders all CSS information. Search engines allow minified version of CSS as in case of JS to increase response time. Recommended snippet is described in Table 4, and inline CSS is discussed in Table 5. Moreover, according to [25, 26], try to include a critical portion of CSS in the head section of the web page.

Table 4. Above the fold CSS

Avoid snippets	Recommended snippet
<pre><HTML> <head> <linkrel="stylesheet" href="example.css"> </head> <body>Content Area</body></pre>	<pre><HTML> <head> </head> <body> Content Area <link rel="stylesheet"href="example.css"> </body></pre>

Table 5. Inline necessary CSS

Avoid snippets	Recommended snippet
<pre><HTML> <head> <link rel="stylesheet" href="example.css"> </head> <body><div class="blue">Content Area</div></body></pre>	<pre><HTML> <head> <style>.blue{color :#cccccc;text-decoration:underline;}</style> </head> <body><div class="blue">Content Area</div></body></pre>

3.2.3. Minify HTML

Google and Bing have given lot more importance on HTML of webpages [26]. For this, they recommend to give cache version of HTML, while accessing same page again and again. Lots of recommendations were provided in recent years to make user happier while searching query in search engine. Important recommendations are discussed next.

3.2.3.1. Insert Structure Data Markup

Structured data markup is a standard way to annotate content so machines can understand it. When webpages include structured data markup, search engines, then use this information to index SERP's result better. Site can enhance its search results with:

- a) Rich Snippets
- b) Breadcrumbs
- c) Sitelinks Search Box

A) Rich snippets offer an extra amount of information to users as well for search engine. For example person searching for movie (Frozen 2013) in Google will find results as shown

in Figure 2. Users not only get basic movie information, their interest on that page is also a ranking signal in search engines. Not all users watching such results in SERP's, convinces him/her to visit such pages, which will increase CTR and bounce rate for that page.

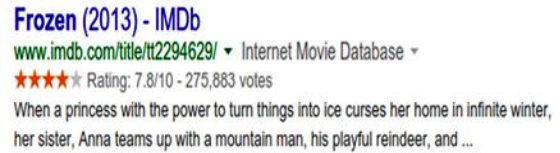


Figure 2. Rich Snippets in SERP's

Google supports Rich Snippets for the following data types [32]:

- Product- Information about a product, including price, availability and review ratings;
 - Recipe- Recipes that can be displayed in web searches and Recipe View.;
 - Review- A review of an item such as a restaurant, movie, or store;
 - Event - An organized event, such as musical concerts or art festivals, that people may attend at a particular time and place;
 - Software Application - Information about a software application, including its URL, review ratings, and price.
- B) Breadcrumbs are used for easy navigation on websites. An example of such SERP's is shown in Figure 3. In Figure 3, three breadcrumbs are: Arts, Books and Poetry. These breadcrumbs make it easier to navigate webpages. Google provide complete detail in [10] on how to implement these snippets in HTML code.



Figure 3. Breadcrumb in SERP's using Structure data Markup

- C) With Google Sitelinks search box, users can discover site content more correctly and precisely without computational overhead [33].For instance, assume a user needs to discover a feature related to puppies health on YouTube. User just searched the YouTube for his query, follow the link to YouTube, and then actually search for the dog health videos, as shown in Figure 4.

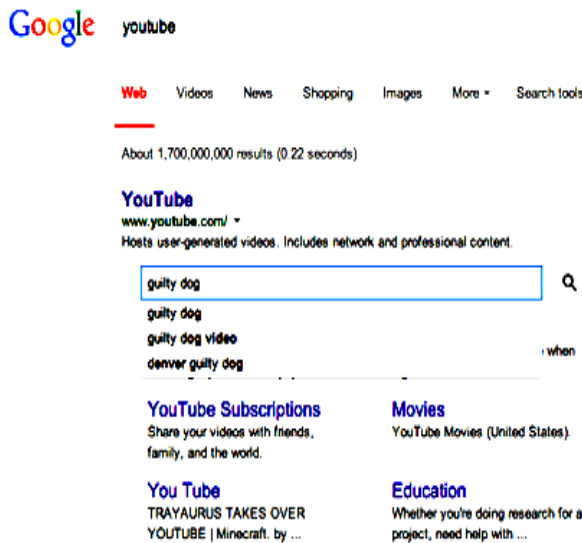


Figure 4. Google Site link Searched

3.2.3.2. Optimize Images

On a web page, images are generally responsible for most of the bytes downloaded [31]. Due to this, image optimization can offer both performance improvement and byte savings. If image size is small, then the browser renders image in less time, enhancing SERP’s improvement for major search engines. Major search engines have forced webmasters to use vector images, whose quality upon shrinking or expanding is never disturbed. Other recommendations include minifying image size using compression tools available online such as Yahoo Smush [22]. Google has pointed out all image optimizations techniques in [23]. Some important recommendations are:

- Eliminate unnecessary image resources;
- Apply CSS3 effects where possible;
- Use web fonts instead of encoding text in images;
- Use right image format. Check JPEG, PNG, GIF while saving image. Moreover, check size and quality of image and use that image which serves best.

3.2.3.3. Mobile Responsive Sites

In April 2015, Google has given a new signal that is for mobile responsive sites and will get SEO ranking in SERP’s [34]. The statistics in [7] showed that in America 94% people with smart phones search for local information on their phones. Interestingly, these knowledge sources are mostly accessed at home or from work places [8]. There are many factors which are to be kept in mind while implementing, such as:

- It is easier to share single link on social media site rather than duplicate links;
- It is easier for Google to redirect traffic to single page rather than multiple version of website;
- Saves resources when Googlebot crawl website;
- Google index more website content and keep it appropriately fresh.

Be sure not to block the crawling of any page (CSS, JavaScript and images) for any Googlebot using robots.txt or other methods. Googlebot detects necessary scripts to provide exact view of website if it is responsive.

3.2.3.4. Browser Caching

When a web program shows a site page, it needs to load a few things such as logo, CSS document and other different contents. There is no need to stack already loaded content again and again. Once it is loaded at user computer, it must be cached. Google provides changes in code snippets to overcome such issues to increase server response time as well.

Each resource should specify an explicit caching policy that answers the following questions: whether the resource can be cached and by whom, for how long, and if applicable, how it can be efficiently revalidated when the caching policy expires. When the server returns a response it must provide the Cache-Control and ETag headers [24]:

- **Cache-Control** defines how, and for how long the individual response can be cached by the browser and other intermediate caches.
- **ETag** provides a revalidation token that is automatically sent by the browser to check if the resource has changed since the last time it was requested.

3.2.3.5. Reduce Server Response Time

Server response time measures to what extent it takes to load the fundamental HTML. Server response time must be less than 200ms. There are many potential elements which effects server response time that includes:

- Slow application logic;
- Moderate database questions;
- Slow routing;
- Structures;
- Libraries;
- Asset;
- CPU starvation;
- Memory starvation.

When the issues are determined, try to overcome future execution bottlenecks.

3.3. Keyword Selection and its Importance in Text

Keywords selection is the most difficult task while making online business profitable. Picking right phrase for website, which describes website content, is a challenging task. It is not about attracting visitors to site rather bringing right visitor to right site. For example, for an online book store, what will be the worth of keyword that is chosen for optimization in SERP’s. User can make more sales on “*history books purchase online*” or “*purchase Science books on low price*”. Well this is confusing. Following factors should be kept in mind before choosing the keyword:

- Does user keyword describe the webpage content?
- Or searches find what they are looking to achieve?
- Are they happy? Does this search bring any financial reward?

- Does it increase any bounce rate?
- Does it increase CTR?
- Does it increase average visit length?

Bringing new idea is not much easier, so if users or web developers are trying to get good rank in SERP's, for a new site for which many other sites have already optimized their content for same keyword, then focus should be on those keywords which are searched widely. However, most of sites neglect them to put in their text and title tag. Google Adwords Keyword [12] planner provides this facility to easily search keywords for local campaign or internationally whom you are thinking to target. For example, keywords searched for term "Book" has phrases which were searched in last 12 months are shown in Figure 5.

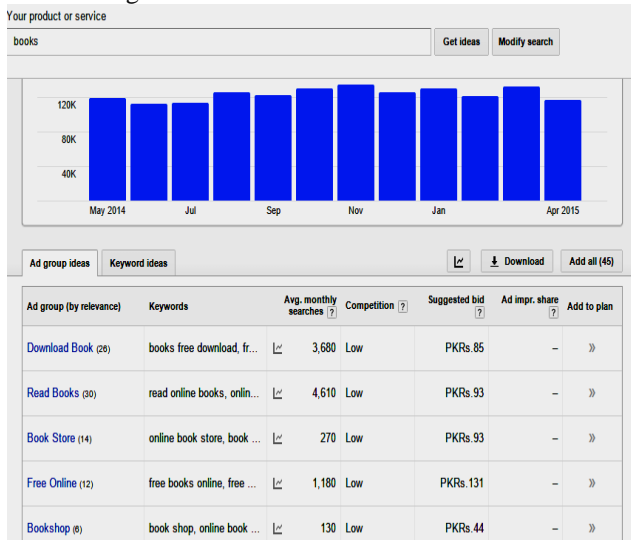


Figure 5. Keyword search using Google Adwords keyword planner for "Book"

Those keywords should be picked whose competition is low. Low competition means only few people around the globe are working on this topic. Keywords with medium and high competition are not suitable for newly created websites. For newly create website try to pick long tail keywords; as long tail keywords, take brief view of our online book store example, it would be great to rank #1 for the keyword "buy books".

Keywords with searches more than 5,000 or even a 500 searches per day covers 30% queries, so what left is 70% of users queries are long tail keywords. The long tail contains hundreds of millions of unique searches that might be conducted a few times in any given day. However, when taken together, it comprises the majority of the search volume worldwide. Long tail keywords serve better than single phrase because they catch people later in the buying/conversion cycle. A person searching for "book" is probably browsing and not ready to buy. On the other hand, someone searching for "best book to buy in 2015" will increase chance to engage that user in website.

Website with domain age less than six months should follow these guidelines while picking keywords:

- Pick keywords which are less optimized;
- Keywords with complete phrase.

A) Keywords which are less optimized can be searched after putting complete phrase in Google. When query is searched, Google will show total numbers of web pages which have same title tag. Figure 6 shows "free books online" results.

In Figure 6, 310,000 web pages have title for searched query, so "free books online" is not a good keyword to optimize for web pages whose domain age is less than six months. Keyword "urdu book free download" has 1900 searches from last twelve months as shown in Figure 7, but online 50 web pages have title "Urdu book free download" (Figure 8).

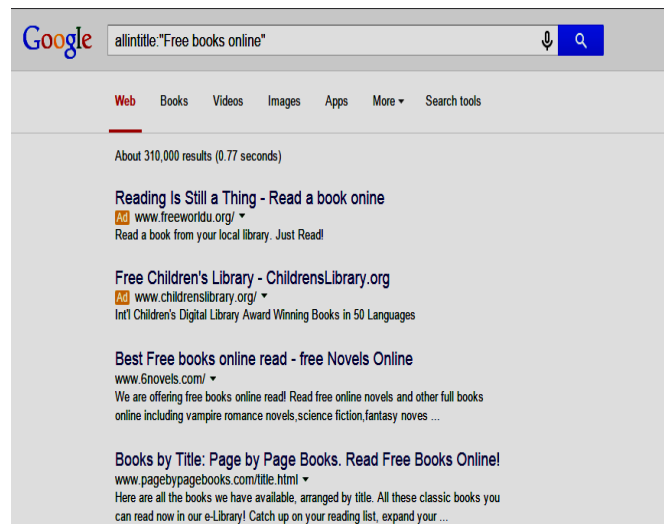


Figure 6. Finding less optimized images using allintitle

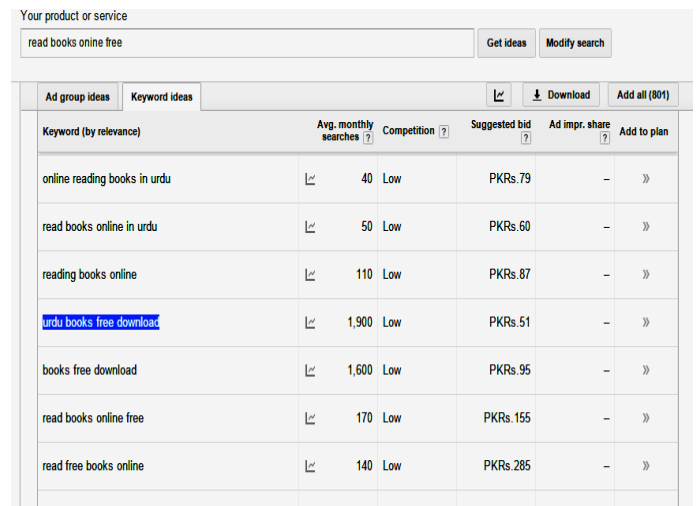


Figure 7. Less optimized images search e using Google Adwords keyword planner

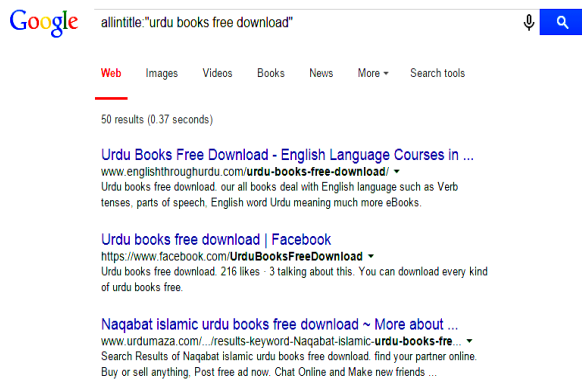


Figure 8. Less optimized keywords checking in Google

Putting such keywords in webpage will direct traffic to web pages in no time. Once users have chosen keywords for web pages, then differentiate home page keywords and web pages keywords according to these roles. Suppose a user or web developer is creating a website related to mobile phone specifications and price. Then:

- Home cannot be optimized for more than three to four keywords;
- Home page must have keywords which give complete idea of whole website e.g. (mobile phones specifications, mobile phone prices);
- Category pages have keywords related to brands, e.g. if category page is Nokia mobile phones then keywords give idea related to that page such as “Nokia mobile phone prices, Nokia mobile phone specifications”;
- Detail page must include keywords related to brand new model e.g. if Nokia launches Nokia C1, then keywords would be Nokia c1 price, Nokia c1 specifications.

Once users have chosen keywords for whole website, then they must follow the subsequent.

- Keywords must be included above the fold content;
- Once primary keyword is placed in text then there is no need to repeat it again and again;
- First paragraph of content must have primary keyword;
- Title and meta description of webpage must have primary keywords;
- Link to category and detail pages must have keyword in URL;
- User must include *H1, H2, H3* tags in detail and category pages, which clearly gives idea about primary and secondary keywords;
- Images must have *alt tag* which must have primary keyword in it.

4. CONCLUSION

Nowadays, with billions of web pages on Internet, search engines have made it easier for people to find online information. Searching for right information through pages and displaying only the relevant results to the user is a complex task. In this article, On-page SEO techniques are

discussed that enterprises, web developers and bloggers can use to increase their site’s visibility in SERP’s. Main focus is on SEO techniques for getting high ranking in Google search engine. However, webmasters, bloggers and SEO persons should keep themselves up to date with frequently changing ranking algorithms and with the associated changing practices of search optimization professionals. Moreover, they need to remain in touch with major search engines guideline on daily basis.

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