A Comparative Study on Various Search Engine Optimization Techniques

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Abstract: **An optimized search engine will earn more traffic towards the website .it will target the audience to find the site. We will also be able to give a tough competition to the competitors through the well optimized website. It will also increase the experience of the user. SEO also provides the latest trend of voice search optimization. The upcoming trend of the search engine optimization is SEO copy writing which is a form of online writing which contains keywords of the readers that they type in search box for the information. Optimization of search engine is done in two different ways on -page and off-page, which focuses on various aspects of the website Optimizing the search engine involves various techniques as optimizing the page content, auditing the website, mobile friendly, search language, meta description and page speed, body tags, keyword density, page title url structure, influencer outreach, social media engagement, forum submission.**

Keywords: **Search engine, optimization, on-page, off-page, information.**

1. Introduction

Search engines are used to find the information on the web based on the provided keyword. It is the process of finding the relevant page to the user. The search engine is optimized by keyword optimization, website content optimization, website navigation, webpage optimization, Link optimization. The different types of search are Navigational, informational and Transactional search queries.

- *Navigation search:* It is a type of search where the user focuses on the particular website or webpage. It is one of the most common type of searches. The navigational search is performed when the user does not know the exact web addresses.
- *Informational search:* It is the earliest type of search. In this type of search, the results are to be found in higher amount which involves vast types of topics. The users generally opt for the informational search for guidance or background information.
- *Transactional search:* In this type of search, the it focuses on completing a particular task of transaction on purchasing. It includes particular brand or a product name.

2. Search Engine Optimization Technique

The search engine optimization is done in two ways
- On-page optimization
- Off-page optimization

A. On-page optimization

It is the Process of optimizing the individual web pages for higher rank and earn more traffic in search engines. It is refers to both the HTML Source code and the content of the web pages such as page titles, meta description, meta tags, URL structure, body tags, keyword density, image see, internal linking . The On-Page Optimization techniques are:

B. Link optimization

It is a method where the internal and external links are optimized to calculate and determine the relevance of the webpage. Internal link is a hyperlink for another for another webpage of document or an image, External link are the hyperlinks that target to another domain. The link analysis tools are used to analyse how the source website is linked to target website. Navigational and menus include the internal links as it provides the structure to the website. Linking of the webpages plays an important role in the search engine optimization, the time spent on the website, page views per session are calculated using the optimization tools.The ranking factor for the link will boost the website page position in SERP (Search engine Result Page). For the optimization through the link the target links have to be reached within few clicks by the user from the home page, every link in the page should reach to the target page, the number of links in the page should be limited, Usage of appropriate keywords, Link with image tag should consist of alt attribute.

C. Keyword optimization

keywords are phrases in web which are used by the user to provide the query for the search engine. The search engine provides the results by matching the keyword with the document. The optimization of the keyword is done by. keyword frequency, it is how many times does a keyword appear in the title and description of the website. Keyword weight, it refers to the number of keywords that appear in the page to the number of words present in the page.

Keyword proximity refers to the placing of keyword on the webpage in relation to each other and also similar to the meaning of queried keyword. Keyword prominence refers to how early does a keyword appear either in a first heading or the first paragraph. Placing a keyword differs from one search

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engine to the other in some search engine the keyword placed in the title tag or the heading is considered more relevant in the other the keyword placed with the link in a webpage is considered more relevant.

D. Content optimization

The search engine contains rich and high-quality Content. The contents of the website are updated on a daily basis. Higher the quality of the content, the higher the ranking and traffic is gained by the webpage. The process of SEO content copywriting can be performed by including the keywords and information phrases which conclude with an actual content for search engine.

The optimization of content is done by focusing the targeted visitors, Headings and titles should be distinctive and striking to the visitors to go ahead and read, Language used should be very simple and not complex to confuse the visitors and dividing the contents by paragraph will make visitors easily readable.

E. Off-page optimization

It is the technique which is used to improve the position of a website in search engine result page, which are used to help create the high-quality backlinks. The off-page optimization Techniques are.

F. Abbreviations and Acronyms

Link Building

it is the process of obtaining the links from external websites to increase the search engine ranking. The amount of backlinks that is, every time the crawler crawls the same website for the search result the popular the website and better optimized. The strategies of link building are Outreach, blogging, broken link building, unlinked mention, link reclamation, paid promotion for "linkable assets", drive the traffic with targeted blog commenting.

G. Social bookmarking

It is another way of promoting the website by submitting the latest blogs and pages to the popular bookmarking sites. The search Engine is mostly focused on these types of websites as they are frequently updated. It builds the reference point for the website and makes them available to the visitors which in turn gets the higher traffic. Social bookmarking strategy is to use a bookmarking websites, sharing the knowledge the blogs, posts and forums

H. Directory submission

The directories are the websites that hold the information. There are two different types of directories namely instant directories and authority websites. In instant directories the submission of the information is instant and no need for the approval. But, authority directories have to be taken the approval by moderator. The benefits are increase in backlinks, uses anchor tags and hyperlinks for link reputation and popularity, indexing in search engine.

I. Benefits of SEO

- Definitive increase in traffic
- Increases brand awareness and equity
- Payment less ads
- Increase in clicks than PPC(pay-per-click)
- Results in higher conversion rate
- Increase in website speed
- Keeping up with the competitors

J. Drawbacks of SEO

- Time consumption is more
- Variation in search engine algorithms
- High Competition with growing market trends every minute.

3. On-page optimization tools

A. SEO crawler

It is the leading on-page tool in the industry which is used for the purpose of optimizing the chosen keywords. It is an automation process that will analyse the page in a single click, shows the page speed, duplicate tags and contents, keyword optimization and broken links. It reduces the hours of manual work. The Ranker tracker in the tool provides you with the tracking of optimized results.

B. Copy space

The contents of the website are done by the writer or the content creation company. Copy space allows you to check the contents of the website are truly unique and is not from other sources. It provides the online copyright protection. The tool is used in various online publications, blogs and marketing materials.

C. Google's page speed insight

It allows the user to analyze the page and targets the key main areas which requires an improvement so that the page is loaded faster and is ranked higher. It grades the website on the scale of 1 to 100 and provides a report in suggestion for the optimization.

D. Off-page Optimization Tools

1) Ahrefs

It is one of the useful tool for identifying the link opportunities. It provides the report of all the sites and individual pages that link to that domain. The various features of Ahrefs are, it provides qualitative inputs for the organic search, Extensive backlink analysis report, keyword analysis, content explorer, URL ratings, Link intersect.

E. Evernote

It is an incredible service that will help in improving the digital marketing. Its main uses are in blogging for Round up

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articles, Affiliate marketing, Copywriting, promotion of blog posts on social media, getting traffic to the site, Blogger Outreach, creating blog graphics, Email marketing, Guest blogging, Getting traffic from quora.

F. Storify

It is a social network service tools that creates stories and timelines in social media such as Facebook, Twitter and Instagram. Media organizations use storify for the coverage of ongoing news stories such as meetings and events. It allows importing content from various media form into a timeline.

G. Working demo of SEO Crawler

- *Input:* List of links for crawling
- *Output:* Crawled page links is displayed on the console.

```
function pageVisit(url,callback,pageVisited, crawledPages){

    pageVisited[url]=true;

    console.log("visited Page"+url);

    var start=new Date();

    request({url;    url,followdirect,:false},function(error    ,

response , body) {

    if(error){

        callback();

        return;

    }

    var responseTime =  new Date() - start;

    var thispage = new Page(url, response,body,responseTime);

    console.log("status code :"+response.statusCode);

    if((response.statusCode == 404)){

        if(thisPage.locationUrl.indexOf(hostName)!=-1){

            pagesToVisit.push(thispage.locationurl);

        }

    }

    if(thisPage.contentAllowed(['html','text'])){

        thisPage.pushDataTo(crawledPages);

        numPagesVisited++;

        }

}
```

The above code snippet is used for crawling the websites links based on the hostname and if the link is not found in the index it gives the appropriate error.

H. Working demo of google page speed insights

- *Input:* website HTML pages.

- *Output:* Optimized website with fast load time

```
def __init__(self, api_key == None)
    self.api_key = api_key;
    self.endpoint                                   =
'https://www.googleapis.com/pagespeedonline/v2/runPageSpeed'
def      analyse(self      ,url      ,filter_third_party_resources=
False,screenshot = False,strategy=False):
    strategy = strategy,lower()
    if strategy not in mobile ('mobile','Desktop'):
        raise valueError('invalid strategy: {0}'.format(strategy))

    raw =  request.get(self.endpoint,params=params)
    if strategy == 'Mobile':
        response =  MobilePageSpeed(raw)
    else:
        response =  DesktopPageSpeed(raw)

    return response
```

The above code snippet will increase the load time of the web application in both in desktop and mobile.

I. Working demo of Ahrefs Ranker

- *Input:* website Url ,Keywords in websites
- *Output:* Score of Url and keywords

```
<?php
    use ahrefs\AhrefsApiPhp\AhrefsApi;
    $Ahrefs= new AhrefsAPI('[YOURTOKEN]', debug = true)
    $Ahrefs-
>select('date','type','refdomain','domain_ratings')-
    >order_by('domain_ratings:desc',    'refdomain'    )-
>where_gt('date','2018-09-11')
    $result = $Ahrefs->get_refdomains_new_lost();
    echo $result
    $result= $Ahrefs->set_limit(10)->get_ahrefs_rank();
    echo $result
    $Ahrefs-
>select('date','type','refdomain','domain_ratings')-
    >order_by('domain_ratings:desc'    'refdomain')-
>where_get('date','2018-09-11')
    $Ahrefs->prepare_refdomain_new_lost();
    $Ahrefs->set_limit(5)->prepare_ahrefs_rank();
    $result=$Ahrefs->run();
    print_r($result)

?>
```

The code snippet gives the score of keywords in the page and the rank of the website url in the search engine index.

J. Working demo of Storify

- *Input:* website url
- *Output:* blogs post in the social media function getDomain(urlstr){

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```
if(!urlstr) return '';
   vardomain                                        =
urlstr.replace(/^(https?:\/\/)(www\.)?/i,'').replace(/\/.*/g,'')
   if(domain == 'twitter.com') return twitter
   if(domain == 'facebook.com') return facebook
   return domain
}

function storifyThisYoutubeComment(info,tab){
   chrome.tabs.executeScript(null,
   {code:'sfy.fn["youtube"].storifycomment(sfy.lastElementCl
icked);)

});

function storifyThisFacebookComment(info,tab){
   chrome.tabs.executeScript(null,{code:'sfy.fn["facebook"].st
orifyComment()';
});
```

The above code posts the blogs and articles in the social media for the promoting the website.

Table 1
Comparison of search engine optimization

On-Page Optimization	Off-page Optimization
Optimization is done during building of web application	Optimization is done after the building of website
It is the process of optimizing the structure and content of the website	Optimization is done during promoting the website via web in the form of articles, posts and blogs
The developer of the website has the direct influence in the optimization process	The marketer of the website has indirect influence in optimizing and promoting the website
The main focus is given to improve the page for higher rank in order that the search engine can easily index in the top results	Its main focus is on social credibility and industrial authority

4. Conclusion

Concluding that search engine optimization has a major importance in this internet era. As there is a rapid growth in search engine and their technologies optimization plays a great role in putting the best of best results to the users. In this paper, the comparative study is done on the search engine optimization techniques. The features and characteristics of these techniques and also the various tools with respect to the techniques are put forth.

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