STUDY AND ANALYSIS OF TECHNIQUES TO IMPROVE TRAFFIC ON WEBSITE

Priya Prajapati
Department of Computer Science
V.M. Open University, Kota, Rajasthan, India

Neeraj Arora
Assistant Professor, Computer Science
V.M. Open University, Kota, Rajasthan, India

Abstract— **The aim of this research is to increase the traffic on Website through multiple techniques. Hence, it is necessary to enhance the traffic on Website to improve ranking. Therefore, the primary effort in this research is to explore the factors and techniques that contribute to a page ranking highly in a Website. We examine major changes in Web traffic characteristics during this period, and also investigate the enhancement of traffic. The problems of traffic enhancement represent great challenges for high ranking of Website. The research is divided into two parts. The first part is to analysis current level of ranking and another is ranking of website after technical or non-technical changes. We will measure the ranking through SEs hits. The result will reflect in following term: Band-width, No. of visitors, No. of visitors after changes, No. of hits and No. of followers [8].**

Keywords—**Web Traffic, SEO, SEM, Optimization**

I. INTRODUCTION

WWW is an information space where web resources are identify by URLs, interlinked by hypertext links, can be accessed via internet. Where, a website is a collection of webpages, including multimedia content, typically identified with a common domain name, and published on at least one web server. A website may be accessible via a public internet protocol network, such as the internet. All publicly accessible website collectively constitute the World Wide Web, while private websites are typically a part of an intranet. After such explanation we know that a website is a huge collection of web pages. To discuss traffic issues, we need to define two terms -bandwidth and latency. Bandwidth is the amount of data that can be moved through a network link during a given time. It is usually described in units of bit/second. Latency is the time it takes data to travel from a given point in a network to another given point in the network. It is usually described in units of seconds or milliseconds. Web site traffic analysis systems are typically used to understand how different pages forming, sites are accessed by their target audience over time. These systems explore data stored in Web server's log files (and/or other kinds of data on users' accesses) and output different statistic reports, such as the number of accessed pages, the rank of the most accessed pages, the number of visitors in a given time frame, and so on[12]. The reports are commonly presented in some standard forms, for example list, tables, plots, or charts. Traffic volume is increasing and evolving due to the popularity of social networking, files hosting, band-width and no of visitors. To understand traffic trends there is need to collect hits in a certain period. The phenomenal growth in Web traffic has sparked much research activity on —improving the ranking of a website. As shown in Fig. 1 when designed and developed a website and used different approach for development, and in Fig. 2 showing the characteristics of a good website and overlapping between these characteristics.
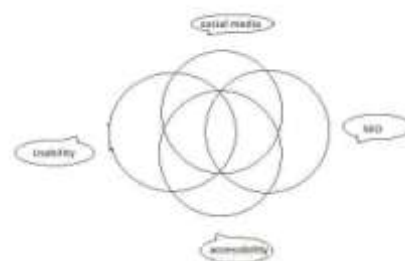

Fig. 1.   Web design and development approach

Fig. 2.   Overlapping between the Four Major Characteristics of Good Website [1]

II. WEBSITE DEVELOPMENT MODEL

A. Browser–

A web browser is a client program that uses HTTP to make requests of web servers throughout the internet on behalf of the browser user. It is a software application for retrieving, traversing information resources on the World Wide Web. A web browser displays a web page on a monitor or mobile device.

B. URL–

A uniform resource locator commonly informally termed a web address is a reference to a web resources that specifies its location on a computer network and a mechanism for retrieving it. We can say it is the global address of documents. A URL implies the means to access an indicated resource. The first part of URL is called a protocol identifier, it indicates the name of the protocol to be used to fetch the resource, and the second part is called resource name and it specifies the IP address or the domain name where the resource is located [2].

C. Domain Name Server–

Domain Name Servers (DNS) are the Internet's equivalent of a phone book. They maintain a directory of domain names and translate them to Internet Protocol (IP) addresses. This is necessary because, although domain names are easy for people to remember, computers or machines, access websites based on IP addresses. Information from all the domain name servers across the Internet are gathered together and housed at the Central Registry. Host companies and Internet Service Providers interact with the Central Registry on a regular schedule to get updated DNS information. When we type in a web address, like www.priyaprajapati.in our Internet Service Provider views the DNS associated with the domain name, translates it into a machine friendly IP address 216.239.32.21 is the IP for priyaprajapati.in and directs your Internet connection to the correct website. After you register a new domain name or when you update the DNS servers on your domain name, it usually takes about 12-36 hours for the domain name servers world-wide to be updated and able to access the information. This 36-hour period is referred to as propagation.

D. IP address:

An internet protocol address is a numerical label assigned to each device participating in a computer network that uses the internet protocol for communication. An IP address serves two principal functions: host or network interface identification and location addressing. The format of IP address is a 32-bit numeric address written as four numbers separated by periods. Each no can be zero to 255.

E. Webpages–

Webpages are building blocks of websites, are documents typically composed in plain text inters presented with formatting instructions of HTML. These are usually written in HTML or comparable mark-up language. It can be displayed in a web browser such as Firefox. A static webpage is delivered exactly as stored, as web content in the web server's file system, while a dynamic webpage is generated by a web application that is driven by server-side software or client-side scripting.

F. Hypertext–

Hypertext is text displayed on a computer display or other electronic devices with references to other text which the reader can immediately access, or where text can be revealed progressively at multiple levels of details. The hypertext pages are interconnected by hyperlinks, typically activated by a mouse click; hypertext is sometimes used to describe tables, images and other presentational with hyperlinks. Hypertext is the underlying concept defining the structure of the World Wide Web.

G. Hyperlink–

Hyperlink is a reference to data that the reader can directly follow either by clinking or by hovering. Text hyperlinks are often blue and under lined. Hyper linking between web pages conveys to the reader the site structure and guides the navigation of the site; hyperlinks often referred to as just "Links", are common in webpages, but can be found in other hypertext documents. These include certain encyclopedias, glossaries, dictionaries, and other references that use hyperlinks. Basically, hyperlinks allow people to browse information at hyper speed, which often starts with the home page containing a directory of the site web content.

H. HTTP–

Hypertext transfer protocol is the set of rules for transferring files (text, graphic, images and other multimedia files) on the World Wide Web. It is a protocol for secure communication over a computer network, which is widely used on the internet. HTTPS consists of communication over http within a connection encrypted by transport layer security or its predecessor, secure sockets layer. The main motivation for https is authentication of visited website and protection of the privacy and integrity of the exchange data [12].

I. Website–

As we know a website is a collection of webpages which are grouped together and usually connected together in various ways and virtual location on WWW. Often called website or simply a site. Each website has its own unique web address, which should introduce what that site offers in terms of information or other services. Web address can be reached through an internet connection. A website can consists of one page, or of tens of thousands of pages, depending on what the site owner is trying to accomplish. A company or an individual tells us how to get to their website by giving us the address of their home page.

J. Search engines–

A search engine is a special kind of website that helps users finds Webpages from other websites. There are plenty out there: Google, Bing and many more. Some are generic, some are specialized about certain topics whichever you prefer. The SE returns a list of "hits" or Web references that match the sample; these are displayed on the Search Engine Results Page (SERP), listed and sorted by relevance. Gathered information is not limited to the text, and can include images, PDF files and other types of content [18].

K. Domain name–

A domain name is an identification string that defines a realm of administrative autonomy, authority or control within the internet. Domain names are used to identify one or more IP address. Every domain name has a suffix that indicates which top level domain it belongs to. There are only a limited number of such domains they are-

gov – Government agencies

edu – Educational institution

org - Organizations

mil - Military

com – Commercial business

in - India

L. Domain name registrar–

A domain name registrar is an organization or commercial entity that manages the reservation of internet domain names. A domain name registrar must be accredited by a generic-top-level domain (gTLD) registry and / or a country code top level domain (ccTLD) registry. The party seeking to register the site will usually pay the domain name registrar a flat or monthly fee to keep the name registration, so that no person is able to acquire the web address. The systems setup by the domain name registrar translates IP address into easily identifiable domain names.

M. Web hosting–

Web hosting is a service that allows organizations and individuals to post a website or webpage on to the internet. A web host, or web hosting service provider, is a business that provides the technologies and services needed for the website or web page to be viewed in the internet. Websites are hosted, or stored, on special computers called servers.

N. Web server–

A web server is a program that uses HTTP to serve the first that from web pages to users, in response to their requests, which are forwarded by their computers' http clients. Dedicated computers and appliances may be referred to as web servers as well [17].

O. HTML–

Hypertext mark-up language is used to represent the text on web browser; all the web browsers execute it. It can represent the text with multiple colors and fonts in web browser. It is a part of World Wide Web consortium in simple words it is the part of web standards [2].

P. Java Script–

A high-level, dynamic, un-typed and interpreted scripting language developed by Netscape to enable Web authors to design interactive sites. Java script was developed independently, java script can interact with HTML source code, and java script is endorsed by a number of software companies and is an open language that anyone can use without purchasing a license. It is one of the three core technologies of World Wide Web content production; it is prototype- based with first-class functions, making it a paradigm language, supporting object-oriented and supported by all modern browsers.

Q. PHP–

Hypertext preprocessor is a widely-used open source general purpose scripting language. That is especially suited for web development and can be embedded into html. PHP scripts are executed on the server. PHP code may be embedded into html code, or it can be used in combination with various web template systems.

III.   EXPERIMENT AND RESULT

The result we found of five days of this website before any technique implement, this graph is showing the lack of no of views on a website. This is considering the no of views of website www.priyaprajapati.in.

Now, we found some strategy to apply in www.priyaprajapati.in that helps to increase traffic in website.

- Meta Key Word Technique
- Guest Blogging
- Heading Optimization
- Question and Answer Technique (Q&A Technique)
- Referral Technique
- Image Optimization
- Content Optimization
- Email Marketing
- Forum Posting
- Social Media Optimization

We applied these techniques one by one on our website and done   comparison between the records of views, before and after techniques implementation.
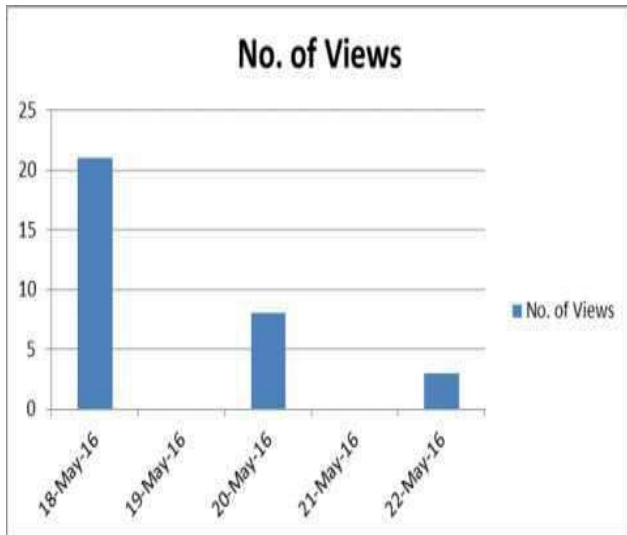
Fig. 3.   Before implementing any of the techniques

A. Meta keyword Technique–

Meta tags are HTML codes that are inserted into the header on a web page, after the title tag. Meta tags are merely part of the overall success strategy. We applied this technique as a first technique on our website www.priyaprajapati.in. And after this technique we get the high no. of views compare to before technique implementation [1]. The code of meta technique on our web site is written below-

<meta content='me@prajapati.in' name='Email'/>

<meta content='all' name='robots'/>

<meta content='index, follow' name='robots'/>

<meta content='English' name='language'/>

<meta content='India' name='country'/>

<meta content='Who i am ? thats a secret.' name='description'/>

B. Guest Blogging Technique–

Guest blogging is a tool that can enhance the author's reputation and exposure. When you start a new blog, your content might have trouble reaching a wide audience, even if it is topnotch. By offering some posts up for other sites to publish, you can reach many more people who can carry over to your site and become subscribers. Guest blogging is a method used by bloggers to increase blog traffic where bloggers write posts to be published on other bloggers' blogs [7]. Guest blogging can work in one of two ways:

- You write a post to appear on another person's blog.

- Another person writes a post to appear on your blog.

List of Website where Guest blogging techniques has applied:
- http://blog.bestamericanpoetry.com
- http://menwithpens.ca
- http://storyfix.com
- http://www.writehacked.com
- http://www.makealivingwriting.com
- http://www.petersandeen.com
- http://thesunmagazine.org
- http://www.modernmom.com/
- http://travelblog.viator.com/
- http://matadornetwork.com
- http://away.com/
- http://inspiringtravellers.com/
- https://www.psychologytoday.com/
- http://www.selfgrowth.com/
- http://www.naturalnews.com/
- http://readwrite.com/
- http://www.sitepoint.com/
- http://www.womenshealthmag.com/
- http://www.huffingtonpost.in/
- http://www.sitepoint.com/

C. Heading Optimization–

Heading Optimization is one of the main techniques to increase traffic on web. This purpose of this post to make you understand how you can optimize Header tags in your post to improve search engine visibility. Heading Optimization is fully related to the Heading tag [5].

There are basically 6 types of header tags –

<h1>This is heading 1</h1>

<h2>This is heading 2</h2>

<h3>This is heading 3</h3>

<h4>This is heading 4</h4>

<h5>This is heading 5</h5>

<h6>This is heading 6</h6>

Use of H1 tags: Title of your post is a H1 tag. A post should have only one title tag as far as SEO is concerned. Using more than One H1 tag is not recommended. Use of H2 tags: You can have more than one H2 tag in your post.

However don't use your keyword for all H2 headings, instead use the keyword in 1-2 H2 tags and try to have LSI keywords other H2 heading. The post should look natural. Use of H3

tags: The usage guidelines are same as mentioned above for H2 tags. Use of H4, H5 and H6 tags: Rarely used. As far as I know no extra benefits of using keywords in such tags or headers.

D. Question and Answer Technique (Q&A Technique)–

Q&A sites and niche forums are some of the best ways to reach your tribe, and engage with your specific community. They can increase your link-building and increase traffic and SEO, develop your business brand, and gain you tons of enthusiastic web traffic.

List of Website where Q&A technique has applied:

- www.quara.com
- http://answers.yahoo.com/
- http://www.answerbag.com/
- http://stackoverflow.com/
- http://www.answers.com/
- http://www.formspring.me/

E. Referral Technique–

Referral traffic is valuable in online marketing because it sends interested readers and qualified potential customers to your site from new domains. It also provides added SEO benefits, since by definition referral traffic is driven either by an inbound link or social activity, both of which send positive signals to the search engines about your site Generally speaking there are three kinds of website traffic: direct traffic, search engine traffic, and referral traffic. All are valuable and serve different purposes, but this post focuses on the third kind, referral traffic.

To track referral we used www.goo.gl

F. Image Optimization–

Image relevancy is important when it comes to image optimization for SEO. An image of a train on a page related to Ferrari will do you no good. I know its common sense but this step is so important that I just can't miss it out.

The Alt tag is probably the most important image optimization factor. Alt stands for alternate. The text in the alt tag is displayed in place of the image if the image cannot be shown or is taking too long to load. If you have an image of the Golden Gate Bridge during a foggy day, your alt tag should read something like this:

Alt="I am Priya Prajapati"

Here is what the full image code should look like:

G. Content Optimization–

Content – whether it be in-depth articles, short blogs, banner ad creative, social posts or landing page copy – can always be better or, rather, optimized for both user experience and search engine rankings. As more brands enter the information-publishing arena for the obvious benefits of improving search engine rankings and meeting consumer demand, they will need either to hire content curators or become writers themselves.

I've highlighted my use of my keyword optimize content throughout this article to show you how I used it. Some of the things to keep in mind when incorporating a keyword are to include it in:

- The title of your content
- The first sentence of your first paragraph
- At least one heading within the content
- The page's URL
- The page's meta description
- The alternate text field of any images you've included

H. Email Marketing–

Email marketing is the most cost effective channel that business owners and marketers use to promote, reach, engage, acquire, retain, maintain and build relationships with customers or potential customers. As your customers and potential customers opt-in to receive your emails, whether it is newsletters, promotions, exclusive offers, guides, or articles, try to gather more information about them so you can provide targeted content they will find compelling, useful, or entertaining.

Email Marketing Optimization Strategies:

1.   Email Service Provider: Invest in and select a good Email Service Provider (ESP) that you can partner with to provide you with a dedicated IP address, reporting and the ability to monitor delivery, clicks, and bounce rates, and provide help managing relationships between the Internet Service Providers (ISPs) like Google, Comcast and Yahoo, etc.

2.   Create a Text Version Email: Ensure you always create a text-only version with HTML emails. There are a number of email users who opt to view their messages as text only so the video and images you have in the fancier HTML version will not be seen by the text only recipients. Also, depending on the type of mobile devices they are using, having text version emails will load faster.

3. Landing Pages: Develop landing pages specifically for the product, services, promotion or contest listed in the email– add targeted "keywords" pertaining to your industry or products to those landing page by adding a sign up form and/or call to action.

I. Forum Posting–

Forum posts are becoming a more and more popular way of increasing the page ranking of company websites and individual blogs alike. Forums are communities the members of which share the same interest and passion and are willing to disseminate information about the topic that interests them, helping each other solve niche-related problems.

How to Create Forum Posts

Forum post creation is relatively easy. All you need to do is find a relevant thread in an authoritative forum, create your own profile where you add the URL of the website or landing page you are promoting and then start adding your own contribution. You can also decide to start your own thread by describing a problem or offering a solution to a problem that is widespread, but not yet mentioned in the forum; then you can engage into conversations with the other forum members. Whenever you post a comment, your forum nickname and other account details will be displayed next to your comment, so that other members can find out more about you.

J. Social Media Optimization–

Web traffic stats, social media is likely to be among the top three traffic sources. In fact, for many blogs, social media traffic is even more important than search engine and direct traffic. On the other hand, you'll find many bloggers complain about the ineffectiveness of social media and how it's just over-hyped. In reality, however, the amount of traffic you manage to attract from social media and the level of engagement you manage to drive from it depends largely on how you structure your social media posts and the share worthiness your content. Here are some of the high conversion keywords for leading social networks [3].

Facebook – Where, When, Tell Us, Inspire, Submit, Deals, Discount, Warns, Amuses

Twitter – ReTweet, Follow, Social Media, New Blog Post, Check Out, Help, Top,

LinkedIn –Created, Improved, Increased, Developed, Reduced, Researched

Google+ – Share, Promote, Increase, Create, and Discover the test set for this evaluation experiment watermark image randomly selected from the internet. Matlab 7.0 software

platform is use to perform the experiment. The PC for experiment is equipped with an Intel P4 2.4GHz Personal laptop and 2GB memory.
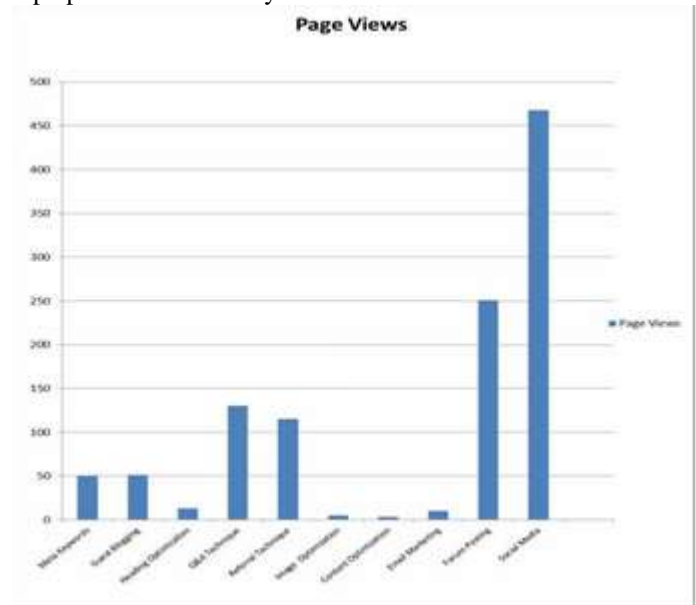

Fig. 4.   Page views after applying various techniques

Here we applied different techniques to increase web traffic and got some interesting results:

- On Applying Meta keyword Technique we got 50 page views on our website. These techniques worked very well to optimize our web traffic. In this technique there are 50% unique visitors. And average hits by visitors were 2.
- On Applying Guest Blogging Technique we got 51 page views on our website. On Applying Headlines Optimization Technique we got 13 page views on our website.
- On Applying Q & A Technique we got 130 page views on our website. In this technique there are 80% unique visitors. And average hits by visitors were 2.
- On Applying Referral Technique we got 115 page views on our website. In this technique there are 45% unique visitors. And average hits by visitors were 3.
- On Applying Image Optimization Technique we got 5 page views on our website.
- On Applying Content Optimization Technique we got 3 page views on our website.
- On Applying Email Marketing Technique we got 10 page views on our website.
- On Applying Forum Posting Technique we got 251 page views on our website. In this technique there are

70% unique visitors. And average hits by visitors were 4.

- On Applying Social Media Technique we got 468 page views on our website. This technique became the best technique which gave the highest web traffic. In this technique there are 40% unique visitors. And average hits by visitors were 8.

IV. CONCLUSION

We show that modern techniques implementation on website improved the ranking ratio, this paper has covered

WWW traffic patterns and technique's efficiency has been compared, and recent advancement on internet traffic classification based on machine learning techniques. Hence, to maximize page ranking, especially for a number of different SEs, one needs to carefully balance a complex set of factors. It is very important to consider all possible ranking factors. The main goal of this research is to enhance traffic on website in such a way that two or more techniques can be used simultaneously. This has many advantages, including better code utilization, better implementation and link building process for high traffic. In this Paper we have evaluated the traffic improvement techniques with different tables and graphs and concluded that the traffic is higher than the Regular traffic.

Experimental result conforms that by using multiple techniques we can increase the performance. Our solution achieves goal by using multiple techniques on a particular website.

V. REFERENCE

[1] Ali H. Al-Badi1, Ali O. Al Majeeni2, Pam J. Mayhew2 "Improving Website Ranking Through Search Engine Optimization" IBIMA Publishing Journal of Internet and ebusiness Studies.

[2] Abdullah S. Al-Rashdi "How to Use Search Engine Optimization Techniques to Increase Website Visibility"

[3] Dushyant Vaghela1 "Social Media Impact on Website Ranking" http://explorequotes.com RK University, Rajkot, India .

[4] David X. Chan, Deepak Kumar, Sheng Ma, Jim Koehler "Impact of Ranking of Organic Search Results On The Incrementality of Search Ads" Google Inc. March 19th, 2012

[5] MarcusTober, Daniel Furch, Kai Londenberg, Luca Massaron, Jan Grundmann "Search Ranking Factors and Rank Correlations" Google U.S. 2015

[6] Mr. Pratik V. Pande1, Mr. N.M. Tarbani2, Mr. Pavan V. Ingalkar "A Study of Web Traffic Analysis" Online at www.ijcsmc.com.

[7] "A Link Building Primer: A Filetonic.com White Paper Exploring White Hat Link Building Techniques." http://www.tutorialspoint.com

[8] DeepikaVerma, Depanwita Seal, AtulPandey "Google Analytics for Robust Website Analytics"

[9] Aurkene Alzua-Sorzabala, Mikel Zurutuzaa, Fidel Rebóna*, Jon Kepa Gerrikagoitiaa "Obtaining the efficiency of Tourism Destination website based on Data Envelopment Analysis" 2015 aCICtourGUNE, Donostiako Parke Teknologikoa,Mikekeletegi Paselekua 71 – 3 Solairua. E-20009, Donostia-San Sebastián, Spain.

[10] SunghwanIhm, Vivek S. Pai "Towards Understanding Modern Web Traffic"

[11] WalterDidimo Giuseppe Liotta Salvatore Agostino Romeo "Graph Visualization Techniques for Conceptual WebSite Traffic Analysis"

[12] Jeff Sedayao "World Wide Web Network Traffic Patterns"

[13] Neeraj Namdeva,*, Shikha Agrawala, Sanjay Silkaria "Recent Advancement in Machine Learning based Internet Traffic Classification" 2015 online at www.sciencedirect.com.

[14] MengCui, Songyun Hu, "Serach Engine Optimization Research For Website Promotion" 2011

[15] Guo-ping Yu1, Li-juan Huang 2, Pan Liu 3, Shi-xin Wang 1 "The design and implementation of the traffic logistics system based on Internet".

[16] Xiao Wang, Ke Zeng, Xue-Liang Zhao and Fei-Yue Wang, Fellow, "Using Web Data to Enhance Traffic Situation Awareness" 2014 IEEE 17th International Conference on Intelligent Transportation Systems (ITSC) October 8-11, 2014. Qingdao, China.

[17] Mark S. Squillante: David D. Yaot and Li Zhang* "Web Traffic Modeling and Web Server Performance Analysis" Proceedings of the 38' Conference on Decision & Control Phoenix, Arizona USA December 1999.

[18] Jianping Cao, Ke Zeng, Hui Wang, Jiajun Cheng, Fengcai Qiao, Ding Wen, and Yanqing Gao, "Serach Engine Optimization Research For Website Promotion"Member,and senior members, IEEE.