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Exploring SEO Techniques for Web 2.0 Websites.

Master of Science Thesis in the programme Software Engineering and Technology

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Göteborg, Sweden, June 2009

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ABSTRACT

Search Engine Optimization is an Internet marketing strategy and a process, widely used nowadays for improving the volume or quality of traffic to a website through search engines. The results generated by search engines can be natural (organic or algorithmic) and/or paid search. In this thesis report, I have discussed different techniques used for achieving better optimization for Web 2.0 based websites. Different techniques related to SEO like keyword discovery, crawling, on-page and off-page optimization and different Google tools are discussed. This study also describes the impact of SEO on Internet marketing. The results from my discussion and investigation will help webmasters to gain a deep insight about SEO and also to guide them in making better decisions regarding their online advertising and marketing campaign.

ACKNOWLEDGEMENTS

I would like to thank everyone that has contributed to my master thesis, especially:

- My advisors Christer Carlsson at Chalmers University of Technology (CTH) and Christian Nicolaisen at Euroway Media Business AB (EMB), for the support, guidance and constructive criticism.

- I am thankful to Vickey Wadhwani for his support during my work at EMB.

- Last but not the least I am very thankful to my parents, friends and entire extended family for supporting me in my study.

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1. INTRODUCTION

In this Information and Technology age; online business, marketing and advertising are very important. These are achieved by making and advertising good websites. However, there are millions of websites on Internet and it is really difficult to advertise or sell your products on such large scale. Internet used to be unstructured before the dawn of search engines. Most popular search engines include Google, Yahoo, MSN, AOL etc. If a person does not know the exact address of a website, he enters keywords in any of the search engines to find the information he needs. In the last decade, there has been a tremendous surge of interest in Internet search engines. Further elaborating this trend is the fact that Internet search engines have become popular both as information-seeking vehicles and as an online advertising media. According to 'The 10th WWW User Survey by Georgia Tech University' [31], Internet search engines are used by 85 percent of the web users. In 2005, online advertising revenue reached $16.5 billion. Leading search engines have turned profit from advertising into income. Google, for example, reported record revenues of $1.578 billion for the quarter ended September 30, 2005, up 96 percent compared to the third quarter of 2004. Of the $1.578 billion, $1.559 billion are related to online advertising [1]. It shows that search engines provide better structure to Internet. Google is the most widely used website on the Internet. It is nothing but a search engine, where users can find information related to their interest.

A search engine is a type of software that works at backend to collect information about web pages. This information comprises of keywords and phrases that are indicators of what is contained in the webpage as a whole, URL of the page, the code that makes up the page and links in and out of the page. This information is stored later in the database. The front end of search engine has a GUI that shows the list of searches after searching a keyword or a phrase [12]. It is a science of designing website to maximize search engine ranking. All of the elements are collected and created with the goal of obtaining higher search engine ranking. Most important elements are entry and exit pages, page titles, site content, graphics, website structure, keywords, links, html and Meta tagging.

Most people do not invest on search engines because in their opinion Search Engine Optimization (SEO) is quite expensive and time consuming. They prefer to go with paid advertisements on the Internet provided by different online companies or hire different companies to perform SEO campaign on their behalf. The main motivation behind my work is not only to optimize a website but also find a package that is suitable to most of the company's (Euroway Media) customers and improve their website ranking in Google. Search for particular information on the Internet can be a very tedious task because of context. For example, if you are looking for a search keyword on the search engine, it may come up with different results such as information related to search engines or algorithms or maps or some route. So, a search is dependent on many things and not easy to achieve. In order to get a desired goal or aim it is important to keep all these perspectives in mind [12].

Euroway Media works on web designing, development and graphic profiling particularly on website design and development. It is successful and growing IT Company with core business in Stockholm. The focus will be ease of use in both

thinking and form. They also have some web based products which include Close Contact, Euroflower (Content Management System), Webhotels and some statistical tools.

1.1 Aims and Objectives

The main aim of this thesis is to analyze, develop and optimize Euroway Media's client websites using Web 2.0 and SEO techniques. Results can be helpful for researchers and practitioners who are working in the area of website design and development especially in SEO and Web2.0 areas. For achieving these aims, we have worked mainly in PHP, XML, AJAX, Adobe Photoshop and MySQL technologies. In order to accomplish my aim I have to achieve following objectives:

- Perform a literature review to get an overview of what has been done in the area of SEO and Web 2.0.

- To find new and existing techniques for SEO and Web 2.0 in order to apply on clients website.

- To find tools that can be used in making websites more optimized in terms of SEO.

- To update existing CMS system of Euroway Media in such a way that it should provide dynamic way of adding data for SEO.

- Modifying the existing layouts of different websites according to Web 2.0 standards

1.2 Research Questions

In order to achieve our aims and objectives I will address the following research questions:

- What literature is available regarding SEO and Web 2.0?

- How to integrate new and existing techniques for making optimized websites?

- What tools are available in market to make websites more optimized for search engines?

- How can we update existing CMS to adopt it to SEO and Web 2.0?

- How can we modify different layouts of existing websites keeping SEO and Web 2.0 standards in mind?

1.3 Expected Outcome

The expected outcome of my study is as follows:

- Research report on Web 2.0 and SEO techniques.

- Comparison of websites before and after implementing Web 2.0 and SEO techniques.

- Benefits and drawbacks of using SEO for Euroway Media.

1.4 Research Methodology

Research can be classified into three different perspectives: field, approach and nature [11]. In the study, we focused on area of software design and development specifically in web development. This study involves a research conducted in industry. There are many approaches to conduct a research such as case study, experiment, action research, surveys etc [11].

I used a case study approach that is a part of qualitative research methodology in my research project. A case study involves the investigation of a particular situation. My study also deals with the same kind of problem which is the reason for selecting this approach. Case study is also supported by action research because this study is more focused on how practitioners do certain tasks rather by asking them. I was involved in all processes. Specifically, after the completion of research related to Web 2.0 and SEO, I was also responsible for implementing and quality controlling it. The focus was to search technical improvements in existing layouts of the products using Web 2.0 and SEO standards. In this case study, I have investigated and evaluated different search engine optimization techniques in websites. This study also presents some useful techniques that can be used in any website without putting too much effort.

This study is a kind of descriptive study, reviewing and evaluating existing theory and knowledge in the field of web design, development and marketing. This project involves a thorough study of Web 2.0 and SEO and improves the understanding in this area. Furthermore, it identifies strengths and weaknesses of this field.

1.5 Research Settings

In order to fulfil the main aim of this study I have developed websites and modified EuroFlower, a CMS system. SEO and Web 2.0 techniques are researched and applied on these websites and CMS system was modified accordingly. The most important websites I have worked on are www.eurowaymedia.com, www.coface.se, and www.alaramexpress.se. Furthermore, Google tools like Google AdWords, AdPlanner, and WebMaster etc are evaluated and used. I worked alone on search engine techniques and presented my finding to the management in the form of presentations and reports. After approval from management, I implemented these techniques. For other tasks, management set goals for me and I implemented them accordingly.

1.6 Structure of Thesis

In section 2, I will provide definition of the concept which will be used throughout the thesis. Section 3 will provide an overview of what has been done in the area of search engine optimization and Web 2.0. Section 4 will describe about what tasks have been implemented in company and how these tasks are achieved. In section 5, I will discuss about different packages and products developed during the thesis work. Section 6 will present recommendations given by me to the company. Section 7 will present advantages and disadvantages of SEO and Web 2.0. In section 8, I will conclude the research work by discussing my findings and I will also discuss future work related to thesis work.

2. BACKGROUND

This chapter will give detail about what SEO and Web 2.0 are? How it is evolved and why it is necessary to use?

Ideally you want your site to be more user-friendly and displayed somewhere on the first three pages of results. Most people won't look beyond the third page, if they get even that far. The fact is, it is the sites that fall on the first page of results that get the most traffic, and traffic is translated into revenue, which is the ultimate goal of search engine optimization. To achieve a high position in search results, your site must be more than simply recognizable by a search engine crawler. It must satisfy a set of criteria that not only gets the site catalogued, but can also get it catalogued above most (if not all) of the other sites that fall into that category or topic.

Besides website development and graphic profiling, Euroway Media has some products that are used internally. Most important of them is Euroflower, a CMS system, which is integrated and shipped with every client's website. Now they are also offering a system for search engine optimization solely based on my research. For website development they use PHP, AJAX, CSS, JavaScript, Adobe Photoshop, Flash, Dreamweaver and MySQL database. Mainly, Euroway Media works on AJAX based websites which are exceptionally good for user friendliness but unfortunately are not suitable for search engines. After my research, they have developed different approaches and packages for different clients keeping their target needs in mind. If clients are more focused towards marketing of websites then SEO package is included with solution and the website is not developed in AJAX. If the client is more focused towards user friendliness and not interested much in SEO package then websites are AJAX based.

Web 2.0 is a second generation standard for developing and designing web application that facilitates communication, secure sharing of information, interoperability, collaboration and user-friendly design of World Wide Web (www) [22]. Whereas, SEO is a science of customizing elements of your website to achieve the best possible search engine ranking or appearance. In other words, you can say that it aims to increase the number of visitors to a website by improving rankings [20, 21].

There are different techniques and tools for achieving search engine optimization. Google has provided some tools for this purpose that now become a standard for every search engine optimization campaign. Some important tools are Google Webmaster Tools, AdWords, AdPlanner and www.pagerankme.com. Google Webmaster helps you with crawling and indexing questions, introduce you to offerings that can enhance and increase traffic to your site and connect you with your visitor. Google AdWords is used by webmasters to create their own ads and keywords for displaying on Google search. Google AdPlanner is a free media tool that helps you in identifying websites that your target audience is likely to visit so that you can make better informed decisions. www.pagerankeme.com is a website that gives ranking of your website.

3. LITERATURE OVERVIEW

In this chapter, I will present the existing literature on SEO and Web 2.0 related to my work. This literature study will enable us to know more about SEO and Web 2.0 and this literature study will help me in conducting research at Euroway Media more effectively. I gathered data for my research from different mediums like research papers, books, web articles and Google help/FAQ. For collecting all this, I used Google search engine and entered terms like SEO, Web 2.0, standards for web design and development etc. Also, I collected some research papers and books from Google scholar, IEEE and ACM research portals. Data collected from these preliminary search results helped me in identifying the sub areas of my study. In the following sections, I will present detailed description of each sub area that is important for my study.

3.1 Search Engine Optimization (SEO)

Search engine optimization (SEO) is such a broad term that it can be quite overwhelming if someone tries to take the whole of it in a single bite. There are so many aspects of search engine optimization. Mostly, SEO depends on how your webpage is designed and its behaviour varies from website to website. Also, you have to invest time and money in order to achieve goals and making SEO campaign successful. However, search engine optimization does not have to be such an enormous task that it cannot be accomplished. Not if you understand what it is and how it works [23, 29].

Search engine optimization essentially involves making it easy for search engines to find your website and boosting your position in their rankings. There are lot of approaches to achieve this. There are lot of ways to achieve search engine optimization and unfortunately most people try to use faster way to achieve it, which is not useful in most case. I used a simple approach to search engine optimization, which in my opinion is most suited not only in this case but will also be useful to most of the campaigns in future. It is an all-encompassing strategy, which allocates time and energy appropriately across a range of valid and ethical SEO activities. Most importantly, it is correctly sequenced, so you can achieve everything in the right order for maximum benefit.

Basically, my campaign is divided in to three major phases namely, planning, implementing and maintaining. These three phases are iterative and interrelated to each other. In my approach there is not too much interaction needed with customers because it is observed that communicating more with customers is a time consuming task and also there is a chance that you will go out of track due to improper communication and lack of knowledge about the field among customers. So, by this simple approach we can achieve SEO as much as we can.

Following are the most important ingredients of SEO that should be present in every website.

3.1.1 Defining Goal

Defining goal means defining who your target audience or/and clients are. What clients want to sell or promote? This will help in finding appropriate keywords and phrases for your campaign. It is important to see in a broader business sense that what sort of visitors will be target customer of your business.

The first and most obvious question is whether you are selling a product or a service and the degree to which you can achieve this online. Mainly, some services are offline, local and personal by their nature. For example, a hairdressing business will struggle to cut hair over the Internet. The best way is to start with a goal definition. This goal definition is very important in writing keyword phrases explained in section 3.1.3. A goal, in this context, defines a successful outcome from someone visiting your website and is expressed using a verb and a noun [23]. Some most important questions at this stage, which are directly related to SEO campaign, could be:

- Are your target customers local or international?
- Might this change in future and is language a barrier in your business?
- Is time a factor for your business?
- Do you want to sell or buy products quickly?

3.1.2. SWOT Analysis of Competitors Website

Main purpose of SWOT analysis in SEO is determination of websites current position and setting its perspective position in future together with website development strategy. I examined following points objectively:

- How the competitor's website looks like?
- Who competitors are and what can one learn from them?
- Does it address each target customer group separately focusing on one segment or try all at once?
- Is it easy to gather information related to business?

It is good to take some time out and get ideas from those who are already running their business online quite successfully.

SWOT analysis for SEO could be implemented for all types of websites, but larger websites will have more variables and hence pose difficulty in achieving actionable deliverables. It is more suited for small to medium websites having fewer variables and thereby more direct actionable results. Most clients for Euroway Media are having small or medium scale business, focusing mainly inside Sweden. Because of this, SWOT analysis is most suitable as it is simple to use and easy to understand, giving fruitful results quite early.

3.1.3. Keyword Discovery

When a user visits a search engine, they type words into the search box to find what they are looking for. The search terms are also called keywords and the combinations of keywords are called key phrase. Keywords are not only most essential in making a website optimized [23] but also the most important and essential ingredients of your SEO campaign. It is recommended by experts that you should undertake keyword research well before you choose a domain name, structure your site, and build your content. However, this is not always possible, as most webmasters only turn to SEO after they've built their site. Even if you already have a site, it is vital to invest significant time and energy on keyword research. It is observed that 20% of all SEO effort is focused on this activity alone [23]. If you make poor keyword selections, you are likely to waste energy elsewhere in your SEO campaign and losing your objective [23].

Most people use preconception or prejudice for selecting their keywords. This is either wholly or partially wrong because this leads to some mistakes that are quite crucial. Following are some very crucial mistakes made during keyword selection.

- Many customers want that their site should be at top when searched in Google. So, they select keywords that are directly containing their website or business keywords. It works only if someone writes the same string in the search field of the search engine. But this is not always possible because one can write something similar to your business. If that string is not present in keywords or at some other place, your business is not achievable and everything is wasted.

- Many webmasters only want to rank well for single words rather than chains of words. It is observed that 33% of all searches on search engines are for two-word combinations, 26% for three words, and 21% for four or more words. Just 20% of people search on single words [23]. When you search for a single word, the results you get are generally not specific enough. It is therefore vital that keyword analysis is firmly based on objective facts about what people actually search on rather than your own subjective guess about what they use [23].

- People tend to copy keywords taken from competitor's website without researching in detail and without knowing much about SEO. Also, some webmasters stuff their websites with keywords. Google spam filter look for these unnatural patterns and filters it. It is advisable that a better use of synonyms and other words related to your main goal should be used. This can be done by involving thesaurus or by some ontological analysis.

In short, you need to make a scientific study of the keywords and key phrases your customers and competitors actually use, and balance this against what your competitors are doing [23].

A high-quality page typically is full of words semantically related to the main search term used. As search engines move ever further toward employing semantic intelligence in their ranking systems, using related keywords will become ever more important to avoid scoring low in the rankings. Perhaps, the phrases you might use to

search for something will not be the same phrases that someone else would naturally use, so some research is required. Mostly in this case, ontology should be used for this research purpose. SEO campaign ideally uses a mixture of these words in all activities. These keywords are used in Meta tagging described in section 3.1.6.3.

3.1.4. Crawling

Crawling is a mean by which a web crawler extracts or collects information about pages from a web site. This is all about helping Google to find and index our website. Google uses a spider program also know as robots or crawler to search web, collect documents, scan text and hand them over to indexing programme. Google's spider is called GoogleBot and it maintains a log that you can see by searching.

There is a tool provided by Google called Google Webmaster, which is used for analyzing information about web pages. When you submit your site to Google Webmaster, it crawls and extracts information from it and displays statistics accordingly. There is no guarantee that how quickly your pages will be crawled by Google and then appear in the search index. However, you would normally expect to be crawled within a week and then see your pages appear in the index in two to three days afterwards. Robots.txt is also used because search engines other than Google are still using the old fashioned way of indexing [18]. Sitemap is very important in crawling and making pages more accessible. Detailed description about sitemaps is given in section 3.1.6.10.

Setting a domain name and choosing a host is very important for SEO. This again depends on your target audience. If you are making a business or want to be ranked or indexed in Sweden then probably you will use '.se' domain. Obviously, speed, reliability, operating system, and flexibility are also important points to consider. Domain name related to your business or company name is also good for SEO.

Another important thing in this aspect is site structure and navigation. Google crawls down through your site and the URL of the first page is a starting point of this crawling. It is recommended you should limit site to four levels and there should be maximum eight pages under one span i.e. under one directory [23]. This levelling and structuring is also described in sitemaps.

3.1.5. How Google Stores Information and Index Pages

Google uses indexing mainly for optimizing, increasing the speed and performance of a search query by breaking down documents into keywords contained in it. This idea of indexing is taken from old card indexing system in libraries. While the use of an index speeds up information retrieval, the tradeoffs are the massive amount of additional storage required to hold the index and the considerable time and effort needed to keep that index up to date. Google has somewhere between 500,000 and 1,000,000 servers, spread out over more than 70 data centres for achieving this [23].

Once GoogleBot has crawled your site, it gives a unique ID to each page it has found and passes these to an indexing program. This lists every document that contains a certain word [23]. For example, the word "euroway" might exist in documents 4, 9, 22, 57, and 91, while the word "media" might be found in documents 3, 9, 15, 22, 59,

and 77. If someone were to search with the query "euroway media" only documents 9 and 22 would contain both words. The Google search box ignores certain words such as 'how', 'where' as well as certain single letters and digits. These words are excluded because these make search slow and narrow it down.

3.1.6. On-Page Optimization

On-page optimization means all techniques that you can use on your site. The on-page elements include page titles, page metadata, headings, body text, internal links, breadcrumb trail and image alt tags etc. Detail of these items is given below:

3.1.6.1. Page Title

The page title tag tells both users and search engines about the topic of particular page. The page title is a string of text, defined by contents of the <title> element in the <head> section of the HTML document. The title is visible both in the title bar of a browser window, as well as the headline of a search engine result. It is arguably one of the most important factors in search engine optimization because it is both an important factor in search engine rankings, as well as a critical call to action that can enhance the click-through rate (CTR). It is the first element that the crawler looks or examines while crawling. CTR is the number or clicks your ad receives divided by the number of times your ad is shown via Google search only [27].

This is important in SEO aspect because of following four reasons [23]:

Algorithmic weighting: The title is the most important single summary or action of what a page is all about and therefore carries the highest on-page weighting in the Google algorithm.

Results formatting: When Google serves up search engine results pages (SERPs) for a user query, it uses the page title as the link for each result.

Browser usability: Browsers display the title tag in the top bar of the browser window and thus, the title is also an important navigation usability aid for browser users.

Directory submission: Some directory services require using titles or listing. They also prefer titles that include, at the front, the name of your site or business.

Here is an example of the usage of title tag in an HTML code.

<center><title> A Descriptive Web Site Title </title></center>

By using the title tags you are increasing the possibility of ranked high in Google. The title for your homepage can list the name of your website/business and could include other bits of important information like the physical location of the business or maybe a few of its main focuses or offerings.

It is necessary to consider a length of the title. Theoretically, there is no limit to how long a title tag can be. However in practice, both search engines and browsers truncate

long titles to make their display consistent. World Wide Web Consortium (W3C) guidelines state that the length of the title tag should, ideally, be 64 characters (including spaces) or less. Search engine spiders use these title tags as the main source for determining the web-page topic. Spiders or crawlers examine the title, and the words used in it are then translated into the topic of the page. That's why it is always best to use your keywords in your page title, and to use them as close to the beginning of the title as possible. This text will appear in SERPs as the linked title on which users will click to access your page [10].

3.1.6.2. Meta Description

In a Meta description you place a brief description about your website build on the keywords selected earlier. A page's description Meta tag might be a sentence or two or a short paragraph. It is placed between the <head> tags of your HTML page. The correct syntax is as follows:

<meta name="description" content="put your description in here."/>

Meta description is very important to improve your sites CTR. Google Webmaster tools provide a handy content analysis section that will tell you about any description of Meta tags that are either too short, long, or duplicated too many times. Google uses Meta description for getting snippets about your page and these snippets later appear in search results in a bold form. This gives the user clues about whether the content on the page matches with what he or she is looking for.

When Google creates search engine results pages, it may use the description tag in constructing the "call to action" snippet that appears below the results link. Some directory services pick up and use your page Meta description as the description of your entry in their directory listings. This applies to both human-edited and some more automated directory services. Many search engines will only display the first 20 characters, so it is recommended that it should be short and descriptive.

'Google Analytics' keyword statistics can also be particularly a useful input to the early stages of an SEO campaign.

3.1.6.3. Meta Keyword

The meta-keyword tag is also placed between the <head> tags in your HTML page and was intended solely for use by search engines. The idea is that the keyword tags provide information to the search engine about the contents of your page (semantic indexing) [23].

The correct syntax is as follows:

<meta name="keywords" content="keyword1, keyword2… keywordN" />

Meta tags are worth pursuing as Yahoo and Ask.com results are still influenced by them but it is almost useless for improving your position on Google but in case of graphic intensive pages that have much of flash, images etc it is useful. Yahoo and

Ask.com search engine always pay attention to keyword tags while Google's algorithm is complex and has lot of things to consider.

3.1.6.4. Meta Expires

Meta Expires tag is used to let the search engine know when the page expires and can be removed from the search engines directory. It can either be set to never, or a date in the format day, month, year, e.g. 28 June 2003. Format for this tag is as:

<meta name="expires" content="never"/>

3.1.6.5. Meta Robots

Meta Robots tag is used to tell the search engine whether you want the web page indexed or not [28]. It is recommended to use it only if you know your website would not be indexed. It has following values:

- Index (default)   Index the page
- Noindex   do not index the page
- No follow   do not index any page that are hyperlinked to this page
- None   same as no index, no follow

Its syntax is as under:

<meta name="robots" content="noindex, nofollow" />

3.1.6.6. Meta Distribution

Meta distribution tag tells the search engine who the page is meant for and can be set to; global, for everyone, local, for regional sites, and UI, for Internal Use.

<meta name="distribution" CONTENT="global">

3.1.6.7. Heading Tag

The heading tag is the next most important SEO on page element after <title> tag. It is actively used in websites. However, it can also be handled by using CSS style sheets. As such, there is no excuse for not using them. Our Euroflower CMS system was modified a little to integrate this functionality.

Regular HTML supports up to six levels of heading tags:

<h1>Your heading text</h1>
<h2>First subheading</h2>
etc.

3.1.6.8. Breadcrumb Trail

The breadcrumb trail is of immense value for usability and SEO but unfortunately, it is neglected in many professional websites. Generally, it is written in the following way:

Home Page » Section name » Category name » Page name – Page description

The symbol used to separate each element is (»), which indicates the direction of travel down through the levels of your site and is rendered as » in HTML. It is also effective in controlling duplicate content in a website.

3.1.6.9. Image alt Attribute

Images may seem like a straightforward component of your site, but you can optimize your use of them. All images can have a distinct filename and "alt" attribute, both of which you should take advantage of. If a user is viewing your site on a browser that doesn't support images, or is using alternative technologies, such as a screen reader, the contents of the alt attribute provide information about the picture.

Another reason is that if you're using an image as a link, the alt text for that image will be treated similarly to the anchor text of a text link. Lastly, optimizing your image filenames and alt text makes it easier for image search projects like Google Image Search to better understand your images.

Here is the syntax for it

3.1.6.10. Sitemap

In general, there are two types of sitemaps. The first type of sitemap is a HTML page listing the pages of your site - often by section - and is meant to help users find the information they need.

XML Sitemaps - usually called Sitemaps, with a capital S - are a way for you to give Google information about your site. This is the type of sitemap used by Google for optimization while yahoo and other search engines use text based sitemaps.

In its simplest terms, a Sitemap is a list of the pages on your website. Creating and submitting a Sitemap helps make sure that Google knows about all the pages on your site, including URLs that may not be discoverable by Google's normal crawling process.

Sitemaps are particularly helpful if:

- Your site has dynamic content.
- Your site has pages that aren't easily discovered by GoogleBot during the crawl process - for example, pages featuring rich AJAX or Flash.

- Your site is new and has few links to it.

- Your site has a large archive of content pages that are not well linked to each other, or are not linked at all.

You can also use a Sitemap to provide Google with additional information about your pages, including [23]:

- How often the pages on your site change. For example, you might update your product page daily, but update your About Me page only once every few months.

- The date each page was last modified.

- The relative importance of pages on your site. For example, your home page might have a relative importance of 1.0, category pages have an importance of 0.8, and individual blog entries or product pages have an importance of 0.5. This priority only indicates the importance of a particular URL relative to other URLs on your site, and doesn't impact the ranking of your pages in search results.

Google uses sitemaps.org as a standard for writing xml based sitemaps which is now standard for writing sitemaps. Sitemap protocol 0.9 is in use now and is compatible with other search engines that adopt the same standards [7].

Sitemap is important in making pages searchable. It can be in .txt or .xml form. For Google, XML-based sitemap is necessary while other search engines like Yahoo! use txt-based sitemaps. Sitemaps.org defines the standard protocol. There are four compulsory elements that the sitemap must have [23]:

- Begin with an opening <urlset> tag and end with a closing </urlset> tag.

- Specify the namespace within the <urlset> tag. The namespace is the protocol or set of rules you are using and its URL is preceded by "xmlns" to indicate it is an XML namespace.

- Include a <url> entry for each URL, as a parent XML tag (the top level or trunk in your site's "family tree").

- Include a <loc> child entry for each <url> parent tag (at least one branch for each trunk).

Here is the sample example of sitemap keeping above standards in mind:

```
<urlset>
      <url>
            <loc>http://www.eurowaymedia.com/</loc>
            <priority>0.9</priority>
            <lastmod>2007-07-12T20:05:17+00:00</lastmod>
            <changefreq>daily</changefreq>
      </url>

      <url>
```

```
            <loc>http://www.eurowaymedia.com/about-us/contactus.html</loc>
            <priority>0.8</priority>
            <lastmod>2007-07-12T20:05:17+00:00</lastmod>
            <changefreq>daily</changefreq>
      </url>

</urlset>
```

The <priority> tag gives Google a hint as to the importance of a URL relative to other URLs in your sitemap. Valid values range from 0.0 to 1.0. The default priority (i.e., if no tag is present) is inferred to be 0.5.

The <lastmod> tag defines the date on which the file was last modified and is in W3C Datetime format, for example YYYYMM- DDThh:mm:ss for year, month, day, and time in hours, minutes and seconds. This format allows you to omit the time portion, if desired, and just use YYYY-MM-DD. Use it for news and blog pages.

Google has its own sitemap generator that helps you in creating sitemap. This package is a part of Google webmaster tools describe in section 3.1.8.1. Google Sitemap Generator is a tool installed on your web server to generate the Sitemaps automatically. Unlike many other third party Sitemap generation tools, Google Sitemap Generator takes a different approach: it will monitor your web server traffic, and detect updates to your website automatically [14].

3.1.7 Off-Page Optimization

Off-page optimization are the strategies for SEO that are done off the page that is not directly related to page content. These are used to maximize the performance of SEO for target keywords related to the page content. Linking, placing keywords in anchor text are some of its examples. There are lot of ways to achieve these; most common of them are press releases, blogging, forum posting, article distribution etc.

3.1.7.1. Anchor Text

It gives the user relevant descriptive or contextual information about the content of the link's destination. The anchor text may or may not be related to the actual text of the URL of the link. For example,

```
<a href="http://www.eurowaymedia.com">Euroway Media</a>
```

Similarly using a title attribute in it is also useful for SEO. Here is a sample example for it [24].

```
<a href = "http://www.eurowaymedia.com" title = "Euroway Media Business"
                        >Euroway Media</a>
```

3.1.8. Google SEO Tools

For SEO research, I have analyzed and worked on following Google tools that serve as core in SEO campaign; these tools include Google Webmaster tools, Google AdWords, Google Trends and Google AdPlanner.

3.1.8.1. Google Webmaster Tool

All major search engines, including Google, provide free tools for webmasters. Google's Webmaster Tools help webmasters better control how Google interacts with their websites and get useful information from Google about their site. Using Webmaster Tools won't help you identify issues that can help your site perform better in search results. With the service, webmasters can [23, 24, 30]:

- See which parts of a site GoogleBot had problems crawling.
- Upload an XML Sitemap file.
- Analyze and generate robots.txt files.
- Remove URLs already crawled by GoogleBot.
- Specify the preferred domain.
- Identify issues with title and description Meta tags.
- Understand the top searches used to reach a site.
- Get a glimpse at how GoogleBot sees pages.
- Remove unwanted site links that Google may use in results.
- Receive notification of quality guideline violations and file for a site reconsideration.

Like Google, Yahoo has Yahoo! Site Explorer and Microsoft has Live Search Webmaster Tools.

3.1.8.2. Google Analytics Tool

After improving the crawling and indexing by using Google webmaster tools you are now looking for checking the incoming traffic to your site. Google analytics is a tool for this. Google Analytics will give you deep in sight about:

- How users reach and behave on your site.
- Helps in discovering the most popular content on your site.
- Helps in measuring the impact of optimizations you make to your site.

For advanced users, the information an analytics package provides, combined with data from your server log files, can provide even more comprehensive information about how visitors are interacting with your documents (such as additional keywords that searchers might use to find your site) [24]. Google also offers another tool called Google Website Optimizer that allows you to run experiments to find what on-page

changes will produce the best conversion rates with visitors. This, in combination with Google Analytics and Google Webmaster Tools is a powerful way to begin improving your site.

3.1.8.3. Google AdWords

Google AdWords allows you to buy advertising on Google's search results pages. Your ad will appear in one of the coloured boxes lined up along the right edge of the page under "Sponsored Links". It's important to take note of the fact that your ad appears only on searches performed on Google's home page, not in results from Yahoo! or sites affiliated with Google [23, 24, 25].

Following are some important advantages of the AdWords program:

Firstly, your ad runs almost immediately after it's submitted. You don't have to wait long before you see your listing in Google. Secondly, you can make changes to your ad as the campaign progresses, which allows you to tweak your ads and keyword selections to get the most for your money. And finally, there is no minimum deposit required to start an ad campaign, so even the smallest of businesses can get exposure quickly and affordably. Like any pay-per-impression advertising, it's imperative to craft an effective ad and monitor your campaign's performance in order to get the most for your advertising.

You will get your results immediately. If you are going through the organic search method, you will only see results probably in a few months time (if you are lucky). You may not even see any results if your website is not search engine optimised. Unlike organic search, Google AdWords will place you in a position whereby your ads will be ready for the world to see and clicked for [17].

Google AdWords has a keyword tool which is in beta stage now. It is used to find keyword for your campaign. For example, if you run a budget hotel, the Keyword Tool can suggest helpful related keywords like "hotel discounts" or "motels." Adding these alternate terms to your ad group keyword lists can help you find new customers that you might otherwise have missed. You can give the URL of your website or some keywords and for both cases it will return some keywords that might be useful for your ad campaign.

This Keyword Tool is especially helpful in following three situations:

- When you first create a new ad group.
- When your current keywords are performing poorly and you need to find better options.
- When you have one keyword that really works well and want to find more like it.

3.1.8.4. Google Trends

Google Trends is a tool from Google that provides the statistics regarding the volume of keyword searches over various time periods. Data are available going back to 2004.

The Google Trends service lets you partition data by language and region and plot multiple key phrases on one graph. This can be used to track and anticipate traffic for a particular period [24].

3.1.8.5. Google Recommendations

Following are some major guidelines given by Google to increase ranking and making your page more optimized [19]:

- Submit your webpage to Google at http://www.google.com/addurl.html.

- Submit your webpage and its sitemap in an XML form using Google Webmaster Tools. Google uses your Sitemap to learn about the structure of your site and to increase our coverage of your WebPages. Don't forget to verify your website first.

- Make sure all the sites that should know about your pages are aware your site is online.

3.2 Web 2.0

Web 2.0 is a second generation of web design and development, facilitating communication, secure information sharing, collaboration, diversifying the operation and connecting World Wide Web. This led to development of social networking, wikis, blogs etc [22]. These ideas or platforms help people in collaborating and sharing information and ideas which are not previously easily available. In other words, you can say that it is a set of economic, social and technology trends that collectively form the basis of the next generation of Internet.

Web 2.0 is much more than just pasting a new user interface onto an old application. It is a way of thinking, a new perspective on the entire business of software from concept through delivery, from marketing through support. Web 2.0 thrives on network effects: databases that get richer the more people interact with them, applications that are smarter the more people use them, marketing that is driven by user stories and experiences, and applications that interact with each other to form a broader computing platform [8].

Web 2.0 has undoubtedly enabled a revolution in the way in which users access and interact with content and each other. The advent of Web 2.0 technologies, websites are changed from static to dynamic, interactive web based applications with the ability to change common desktop functionality [13]. However, the rush to embrace Web 2.0 has resulted in many developers overlooking principles of good design and usability established over the last decade.

Some of the key Web 2.0 features and technologies include [4]. Some of these are explained below:

- AJAX
- Really Simple Syndication (RSS)
- Backend Databases

- Multi-tier software architecture

- Site Maps

- Folksonomy and Web Classification

- Web Tagging

- Social Bookmarking

- Mashups

- Weblogs

- Wikis

- Search Engines

Main focus or idea behind Web 2.0 is usability. It tends to look like desktop applications over Internet in the form of web pages. These pages have multiple interfaces with plain colours, logos, patterns or animations. Moreover, it also provides richness of interaction and collaboration that was not found previously [9]. It is not like making applications more graphic intensive but it is a way to develop and design using frameworks such as Ruby on Rails, AJAX, Django etc keeping more user friendliness and ease of use in mind. These frameworks provide fast development, debugging and deployment. Previously, web pages were not easy to develop and making them more user-friendly and easy to use required much to do. Some examples of Web 2.0 are Google AdSense, Facebook, Flickr, Bit Torrent, Wikipedia etc.

Web 2.0 has changed the desktop programmes to web. Google has adopted and revolutionized this by making Google docs the web based word processor, spreadsheets, Google maps etc. Now experts are researching to make Photoshop and other image processors to web as well. But there are some problems with Web 2.0; web developers have to focus more on presentation and sometimes because of this design data becomes quite messy and unreadable. Some times important information is hidden and automation tasks become tricky and difficult.

3.2.1. AJAX

Ajax stands for Asynchronous JavaScript and XML, is a group of technologies used for web development. With AJAX, web applications can retrieve data from the server asynchronously in the background without interfering with the display and behaviour of the existing page. The use of AJAX has led to an increase in interactive animation on web pages and better quality of web services thanks to the asynchronous mode. Data is retrieved using the XMLHttpRequest object. Despite the name, the use of JavaScript and XML is not actually required, nor do the requests need to be asynchronous [6]. Google Maps, Google Suggest, Yahoo Mail, Gmail and A9 Product Search are some of the famous examples of AJAX [5].

3.2.2. Blogs

One of the best-known features of Web 2.0 is the development of blogs. It is a short online journal, containing contents and web links, where you share your idea, thoughts and research. It's a kind of personal online journal. Contents are sorted in

chronological order with latest on top. WordPress is the most popular example of blogging. It is developed in PHP language and supports RSS and ATOM [11].

Business blogging is a use of blogging for business purposes. There are different blogging platforms currently available. Blogger is probably the easiest to start with while WordPress is the most popular business blog. Personal Blog is a mixture of a personal diary, opinion posts and research links.

Content writing is a form of blogging in which you share your opinions and experiences related to certain field or idea. It is about writing something you love or know. Most blogging softwares are easy to use, having tools for publishing, linking etc. It is easy to use because you don't have to hire a designer or developer for coding. So, by this you can reach to large audience. Some important examples are Wikipedia and GrooveNetworks.

3.2.3. Really Simple Syndication (RSS)

Really Simple Syndication (RSS) is an XML-based content-syndication protocol that allows web sites to share their content with other applications. RSS is a format that allows the user to aggregate information from many different Internet sources such as e-mail, web logs, Usenet groups, news feeds, etc [2, 3]. Pluck and Yahoo are some important examples of RSS.

3.2.4. ATOM

ATOM is a pair of related standards namely Atom Syndication Format (ASF) and Atom Publishing Protocol (APP). ASF is an XML-based, used for web feeds while APP is simple HTTP based protocol for creating and updating web resources. Web feeds allow software programmes to check for updates published on websites. It is developed as and alternative for RSS and adopted by Google as a standard [16].

3.2.5. Search Engine

As described above search engines are services that find web content based on user specified criteria or query. Some important examples are Google, MSN and Yahoo [26].

4. IMPLEMNTATION OF FINDINGS

In this chapter, I will describe how I achieved the goals and the standards described in previous chapters.

4.1 Conversion from AJAX to PHP

AJAX websites are not so very good for search engines, and to make website searchable in search engine we need to develop website with some server side technology. AJAX's ability to pull data from the server after the page has loaded contrasts with what we now refer to as the "traditional architecture." In a traditional architecture, the user must wait for the entire webpage to reload to see new results from the server [15]. Because of these reasons, Euroway Media was using AJAX in their client's website. There are also some major drawbacks of AJAX based websites and the most important is its incompatibility with search engines.

There are many customers of Euroway Media who want to market their product or/and services on Internet and in that situation, there is no better solution than search engine. Based on these requirements, Euroway Media has changed their development model from AJAX to traditional architecture using PHP.

All new websites at Euroway Media that need search engine functionality were developed using traditional architecture (header, wrapper, and footer). The main reason for the selection of this approach was its compatibility with search engine crawlers. The crawlers of all search engines lack ability to read data fetched from JavaScript that is why traditional approach is much better when someone wants to market their products and/or services on the Internet.

4.2. Title, Meta and Other Tags Information

The CMS system uses a database at backend for saving data. In order to achieve these tasks, three fields are added namely title, keyword and description. By doing so we can add a unique title and Meta tag description/keyword for each page.

4.3. Foldering of Data and Unique URL

Different folders are created to put different pages of websites so that each link can have a unique search engine friendly URL. Suppose if we consider the www.eurowaymedia.com website we have a lot of pages and subpages in it like Produkter (Products), Reklam (Advertising) etc. So, all the subpages (like CMS, Webshops etc) that are related to Produkter are put under Produkter folder as a separate folder. In other words you can say that www.eurowaymedia.com/produkter/ is the URL of main page and it has 5 subpages. These subpages are Close Contact, WebHotell, WebShop, CMS and Statistikvertyg. If we click on CMS link the URL would be like www.eurowaymedia.com/produkter/cms/.

4.4. CMS Changes

Euroway Media integrates its own CMS (Euroflower) with every website that is developed by them. A new module was developed in Euroflower in order to add title

and Meta tags in each page of website. With this new module user has the ability to change its information of title tag and Meta tag at any time. The main design consideration in this module was user friendliness and ease of use. The module is designed in such a way that a user who is not so much familiar with html can also add/edit the title, Meta tags and other information.

5. DISCUSSION

After thorough research, an SEO package is devised for Euroway Media. This package consists of 2 levels. Level 1 is a smaller package that includes things which can be done in a shorter period of time, while Level 2 is a bigger package that needs a little more research, time and work.

The first level package has following specifications:

Level1:

- Keyword searching helps in making business more effective.
- SWOT analysis of competitors' websites helps in finding more effective keywords.
- Page Title tag increases the page ranking and enhances click through rate.
- Meta tag description and keyword improves CTR.
- Breadcrumbs help user to see quickly where they are.
- Alt and title attributes increases accessibility and usability.

The second level includes the following specifications:

Level2:

- Sitemap is important for making page searchable.
- Shadow Website in HTML for making graphic intensive pages more accessible.
- Search Engine Friendly URL.

Shadow websites are HTML pages for graphic intensive, flash based websites. Mostly, the search engines are unable to detect such pages. Shadow website is a solution for making such graphic intensive pages search engine optimized. The HTML page of the website is hosted on a host and then a link is provided to the actual flash based page.

Every page must have a title tag and each page's title tag should be different. There should, nonetheless, be consistency across the pages in how the title tags have been constructed.

The length of each title tag should generally not exceed 85 characters (including spaces) and should never exceed 120 characters.

The title should be written in such a way that it gracefully truncates at both 66 characters exactly and 75 characters exactly (including spaces). By gracefully, I mean complete words in a phrase that scans well and uses proper grammar.

The title tag should ideally begin with the name of your business or site and, where possible, should be written in the form of a "breadcrumb trail" that leads users down through the levels of your site.

Where possible, the title tag should incorporate a short call to action (in a verb–noun construct), or at the very least a provocative statement that encourages the user to click on the link.

The keywords used in the title tag should all be repeated in the URL, the meta-keyword tag, heading tags, and page body text. Synonyms of keywords in the title tag should also appear in the page body text.

SWOT analysis is an extremely useful tool for understanding and decision making. It helps in identifying firm's strengths with upcoming opportunities and so formulating a winning strategy for today's competitive environment.

Following are main benefits of SWOT analysis:

- pointing out websites strong points and propositions of its further utilization
- pointing out weaknesses, attributes that make negative impact on web visibility in search engines
- opportunity analysis and suggestions of beneficial improvements and changes
- thread identification and possible elimination methods

5.1. SWOT Analysis of Atrox Webbyrå

Atrox is a competitor of Euroway Media. Atrox webbyrå offers a powerful combination of web design, CMS, Search Engine Optimization and more advanced web solutions like Webdesign, CMS system, Search Engine Optimization Packages and Advanced Web Solutions.

Complete analysis of Atrox keywords was done and keeping its strengths in mind our keywords were decided.

5.2 SWOT Analysis of Medianalysis

Medianalysis is another competitor of Euroway Media. It works with SEO and helps companies that want new customers via the Internet. It collects data from Google, MSN, Eniro and yahoo searches daily. So, it knows what people search and like to search. By this statistics, it helps its customer in starting a good SEO campaign for Internet marketing. It provides 7 different SEO packages targeting different level of companies and their needs.

6. RESULTS AND RECOMMENDATIONS

After complete study of Euroway Media's system, requirements of client and integrating SEO and Web 2.0 with it, following recommendations are given. To make things more optimized in future Euroway Media should keep following points in mind:

- Create a website that contains Meta tags, content, graphics, and keywords that helps in improving site ranking.

- Use keywords on your site that maps with context of your site topic and content, completely defining goal of your business.

- Add your company's link to your client's websites and their links to your company's website. This will increase the chance of getting searched in Google. These links should be legal and relevant to your business.

- Increase website traffic by keyword advertisements and marketing campaigns.

- Submit your web site to search engines manually, rather than waiting for them to pick up your site in the natural course of cataloguing web sites.

Following are the recommendations regarding Google AdWords campaign:

- Use more specific and broad phrases for advertisements.

- Don't use the headline section for company name, although it is recommended by Google. It is because your domain and company name will be displayed by default in a lower part. So it is better to write some thing more attractive and concrete.

Following are some suggestions about using Meta tags:

- Avoid writing a description Meta tag that has no relation to the content on the page.

- Avoid using generic descriptions like "This is a webpage" or "Page about baseball cards".

- Avoid filling the description with only keywords.

- Avoid using copy and pasting the entire content of the document into the description Meta tag. This is a very bad practice.

- Avoid using a single description of Meta tag all across your site's pages.

Following are the suggestions related to on-page optimization:

- Choose a title that effectively communicates the topic of the page's content.

- Title should be brief and descriptive. If title is long, Google will only show a portion of it.

- Create unique title tags for each page which helps Google know how the page is distinct from the others on your site.

- Avoid choosing a title that has no relation to the content on the page.

- Avoid using default or vague titles like "Untitled" or "New Page 1".

- Avoid using a single title tag on all pages or across website.

- Avoid using lengthy titles and keywords.

- Concentrate on advertisement campaigns along with implementation of SEO strategies as this campaign positively affects your SEO effort.

Following are the suggestions related to Google Keyword tools:

- Use this tool to get an idea about keywords related to your business but it is not an authority. It only gives an idea and helps you in deciding the keywords.

- It reduces the guesswork and misusing the keywords.

- Helps in finding keywords with minimal effort and time.

Some suggestions regarding making URL structure:

- Avoid using lengthy URLs with unnecessary parameters and session IDs.

- Avoid choosing generic page names like "page1.html".

- Always create a simple directory structure that organizes your stuff and is easy for visitors to see where your content is.

- Provide one version of URL to reach the page or document.

- Make your site easy to navigate. The navigation of a website is important in helping visitors quickly find the content they want. It can also help search engines understand what content the webmaster thinks is important. Naturally flowing hierarchy is better.

Some recommendations for using heading tags:

- Avoid excessively using heading tags throughout the page.

- Avoid putting all of the page's text into a heading tag.

- Avoid using heading tags only for styling text and not presenting structure.

- Avoid placing text in heading tags that wouldn't be helpful in defining the structure of the page.

Some suggestions regarding alt tag:

- Supply alt tag when using images as links.

- Store images in a directory of there own.

- Avoid using generic filenames like "image1.jpg", "pic.gif", "1.jpg" when possible

- Some sites with thousands of images might consider automating the naming of images

- Avoid writing extremely lengthy filenames.

- Stuffing keywords into alt text or copying and pasting entire sentences.

- Use commonly supported file types. Most browsers support JPEG, GIF, PNG, etc.

7. BENEFITS AND DRAWBACKS

Following are some important pros and cons of both SEO and Web 2.0 techniques.

7.1 Benefits of SEO

Following are some major advantages of SEO:

- The primary advantage of SEO over any other type of Internet marketing is that you can be ranked in top 10 without any fuss. When users search for the information they require, they are most likely to choose from the selections appearing on the first page of results. If your website ranks high, your site becomes much easier to find, thus increasing traffic.

- Return on investment is one of the major advantages of SEO over paid advertising. Your site will take some time to get ranked for your keyword, and once ranked, the return-on-investment (ROI) becomes great as you get a lot of free traffic for your website.

- SEO is the cost effective way of marketing. You don't have to spend much time and money. If your site is designed and optimized properly then it can stay longer as compared to pay per click advertising.

- SEO leads to the increased brand visibility for your site. Your business will start showing for your business related keywords, and more and more visitors will be there to look for the services you are providing through your website.

- Increased visibility and accessibility leads to higher sales for your business.

- The site is available to large portion of the online users. A better optimized website attracts lot of visitors and potential customers.

- There are plenty of approaches to make your site more visible to the public. You may purchase advertising space on Google AdWords, which charge per click. There are also additional pay-per-click marketing schemes that are quite popular with others. This pay per click is not much expensive hence affordable.

- These advantages results as growth in sales as well as increasing your business, credibility and referral businesses online [8].

7.2 Drawbacks of SEO

Following are some major disadvantages of SEO:

- It is observed that the results achieved by SEO strategies are slow and uncontrollable as Google and other search engines frequently change their algorithm and standards for optimization.

- There is a lack of standard among the search engine. Google and Yahoo uses different approaches that makes thing complex for webmasters to implement

SEO strategies. For example Google uses XML based sitemap and yahoo uses text based sitemap for search engine optimization.

- Another problem with SEO techniques is that you have to always update your information. It is not a one time effort.

- Large websites with lots of images, flash animations may find their hosting provision needs increasing. This is normally only a problem with websites on very old host servers. Cost implications are minimal.

- With PPC (page per click) advertising, if a business receives very high traffic or the rate increases, this may lead to pause the advertising and there will be an immediate drop in business or traffic or sales.

7.3 Benefits of Web 2.0

Following are some important benefits of Web 2.0:

- Faster time to market: Agility and rich application development reduces the time to develop, by this you have much time for marketing and selling your products.

- Risk has been reduced because the frameworks, models and approaches are quite mature and handy. Most of them are widely used in industry and well tested.

- By this you have very close relationship with customers. RSS and interface design provides very attractive way of communicating and marketing.

- It also improves the ranking of your website, as everyone is accessing and modifying contents so the traffic on your site is high, which is suitable for search engines

7.4 Drawbacks of Web 2.0

Following are some major disadvantages of Web 2.0:

- Sometimes the Web 2.0 based sites become victim of vandalism, as everyone is allowed to edit contents. There is a chance that a person purposely damage or destroy the contents of a website. To stop this through wikis is a difficult task.

- Another disadvantage is that the person who is adding the contents is anonymous in most of the cases. This feature can by exploited by a person who wants to publish some malicious content.

- Credibility of information is also doubtful in some cases.

8. CONCLUSSION AND FUTURE WORK

In the end, I would like to conclude that SEO is a very important Internet marketing strategy that should be adopted by every company to increase its revenue. On-page and off-page optimization along with paid advertisements is essential for having a better SEO campaign. I have identified some possible direction for future work within this area. These areas are as follows:

- Optimizing results obtained from package 1 and 2. This can be achieved by researching more and updating the client's data in Google and other search engine tools.

- Google should work more on its services to reduce the delay time.

- Complexity and uncertainty in some issues related to search optimization can be reduced by making algorithm more powerful and by providing more concrete tools.

- Development patterns like MVC and frameworks like AJAX should be synchronized with SEO strategies.

- There should be tools at one place and should be compatible to every search engine.

- All search engine companies should sit together and define a single standard that should be acceptable to all.

9. REFERENCES

1. Zhang, J. and Dimitroff, A. 2005. The impact of metadata implementation on webpage visibility in search engine results (part II). *Inf. Process. Manage.* 41, 3 (May. 2005), 691-715.

2. Cold, S. J. 2006. Using Really Simple Syndication (RSS) to enhance student research. *SIGITE Newsl.* 3, 1 (Jan. 2006), 6-9.

3. Richardson, Will. 2005. The ABCs of RSS. *Technology & Learning*, 25 (May 2005), Issue 10, 20-24.

4. Nielsen, J. 2007. 'Web 2.0 'Neglecting good design'. BBC News. 14 May 2007 Available at: http://news.bbc.co.uk/1/hi/technology/6653119.stm

5. Dahlan, A. A. and Nishimura, T. 2008. Implementation of asynchronous predictive fetch to improve the performance of Ajax-enabled web applications. In *Proceedings of the 10th international Conference on information integration and Web-Based Applications & Services* (Linz, Austria, November 24 - 26, 2008). G. Kotsis, D. Taniar, E. Pardede, and I. Khalil, Eds. iiWAS '08. ACM, New York, NY, 345-350.

6. Hope, Paco; Walther, Ben (2008), *Web Security Testing Cookbook*, O'Reilly Media, Inc., ISBN 978-0-596-51483-9

7. About sitemaps.
http://www.google.com/support/webmasters/bin/answer.py?hl=en&answer=40318.
Retrieved on 2009-05-17

8. Advantages of SEO. http://tusharvickkie.blogspot.com/2008/10/advantages-of-seo.html. Retrieved on 2009-05-20.

9. Musser, John and O' Reilly, Tim. O' Reilly Radar (2007), Web 2.0 principles and best practices. ISBN-10: 0-596-52769-1, ISBN-13: 978-0-596-52769-3.

10. Anatomy of Search results.
http://googlewebmastercentral.blogspot.com/2007/11/anatomy-of-search-result.html.
Retrieved on 2009-05-17

11. Millard, D. E. and Ross, M. 2006. Web 2.0: hypertext by any other name?. In *Proceedings of the Seventeenth Conference on Hypertext and Hypermedia* (Odense, Denmark, August 22 - 25, 2006). HYPERTEXT '06. ACM, New York, NY, 27-30.

12. Andrew Goodman. "Search Engine Showdown: Black hats vs. White hats at SES". http://searchenginewatch.com/showPage.html?page=3483941. Retrieved on 2009-05-09.

13. Hailpern, J., Guarino-Reid, L., Boardman, R., and Annam, S. 2009. Web 2.0: blind to an accessible new world. In *Proceedings of the 18th international Conference*

on World Wide Web (Madrid, Spain, April 20 - 24, 2009). WWW '09. ACM, New York, NY, 821-830.

14. Google Sitemap Generator
http://googlesitemapgenerator.googlecode.com/svn/trunk/doc/gsg-intro.html.
Retrieved 2009-05-02

15. Measuring the benefits of Ajax.
http://www.developer.com/xml/article.php/3554271. Retrieved on 2009-04-27

16. RSS and ATOM Compared.
http://www.intertwingly.net/wiki/pie/Rss20AndAtom10Compared. Retrieved on 2009-05-17

17. Advantages of Google AdWords. http://www.learn-internet-marketing-ree.com/2007/10/18/advantages-of-google-adwords/. Retrieved on 2009-05-17

18. Brian Pinkerton. "Finding What People Want: Experiences with the WebCrawler" (PDF). The Second International WWW Conference Chicago, USA, October 17–20, 1994. http://www.webir.org/resources/phd/pinkerton_2000.pdf.

19. Google guideline for optimization of your website.
http://www.google.com/support/webmaster/bin/answers.py?answer=35769.
http://www.google.com/webmaster/guidelines.html. Retrieved on 2009-05-24

20. Search Engine Optimization.
http://en.wikipedia.org/wiki/Search_engine_optimization. Retrieved on 2009-04-24

21. The basics of search engine optimization. http://blogoscoped.com/archive/2007-01-07-n13.html. Retrieved on 2009-04-24

22. What is web2.0? http://en.wikipedia.org/wiki/Web_2.0. Retrieved on 2009-04-24

23. Viney, David. Get to the Top on Google. Nicholas Brealey Publishing. 2008. ISBN: 978-1-85788-502-6

24. Sirovich, J, Darie, C. Professional Search Engine Optimization with PHP, a Developer's Guide to SEO. Wiley Publishing Inc. 2007. ISBN: 978-0-470-10092-9

25. Ledford, Jerri. L. Search Engine Optimization Bible. Wiley Publishing Inc. 2008. ISBN: 978-0-470-17500-2

26. Carter, Sandy, The new Language of Business, SOA and Web 2.0. IBM Press. 2007. ISBN-10: 0-13-195654-X, ISBN-13: 978-0-13-195654-4

27. Clickthrough rate (CTR).
http://adwords.google.com/support/bin/answer.py?hl=en&answer=6305.
Retrieved on 2009-05-29

28. Vanessa Fox, Using the robots meta tag, Official Google Webmaster Central Blog, 3/05/2007

29. Search Engine optimization (SEO).
http://google.com/support/webmasters/bin/answer.py?hl=en&answer=35291.
Retrieved on 2009-05-24

30. Google WebMaster Guidelines.
http://google.com/support/webmasters/bin/answer.py?answer=35769. Retrieved on 2009-05-28

31. Georgia_Tech "How Users Find out About WWW Pages," 1998,
http://www.cc.gatech.edu/gvu/user_surveys/survey-1998-10/graphs/use/q52.htm.
retrieved on 2009-05-21