



Le scienze merceologiche nell'era 4.0

a cura di
Benedetta Esposito, Ornella Malandrino,
Maria Rosaria Sessa, Daniela Sica

**XXIX CONGRESSO NAZIONALE DI
SCIENZE MERCEOLOGICHE 2020**

Atti del Convegno
Salerno
13-14 Febbraio 2020

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20. SEARCH ENGINES: OPERATION AND OPTIMIZATION

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Abstract

In this paper we study the search engine optimization (SEO), as a useful tool to satisfy the purpose of the website owners, for the contents visibility, in order to appear in the top rankings, in returning search results to the search engine. The SEO promotes the website ranking in organic search results, allowing to improve the website visibility among the search engine results. In particular, after analyzing the search engine operation, the optimization activities are examined according to the “on-page” activities and the “off-page” activities. Finally, the focus is on Web Analytics, a statistical activity to measure and analyze the website performance, aimed at measuring the SEO actions adaptation.

Keywords: Search engine, the search engine operation, SEO, Web Analytics.

Introduction

The Search Engine Optimization (SEO) is a useful tool to satisfy the purpose of website owners, for the content visibility, in order to appear in the top rankings, in returning search results to the search engine. The SEO promotes the website positioning in the organic search results, allowing to improve the website visibility among the search engine results. Optimization activities are classified as “on-page” activities and “off-page” activities. To measure the effectiveness of SEO actions we use the Web Analytics, the statistical activity of measurement and analysis of the website’s performance.

The research methodology is based on the bibliographic collection of existing materials and data for subsequent processing, analyzing the conventional scientific literature on the subject and analyzing the most recent websites.

1. The search engine operation

The search engine operation can be summarized as follows (Lupi, 2001): an automated software (Gatherer) “visits” the websites by means of robot (or spider) and sends the relevant information to a database (parse, index);

- a software (Indexer) analyzes the data present in the database and assigns to each individual page a value “relevance” value defining the positioning levels of the pages and taking into account the incoming links, the update date and the meta-tags inserted in the pages themselves;
- a software (search), through a web interface (for example through a browser), allows the querying of the users to the database;
- a software (retrieval) collects the resources identified by the search, formats the results and makes them available to users.

The directories, on the other hand, the operation of which is ensured as for search engines by one or more servers dedicated to the web pages indexing, provide lists of links relevant to the research content. These are therefore catalogs of websites for thematic categories, which, unlike search engines, store only the sites home page. In addition, they are normally filled in manually by specialized publishers, who review sites based on reports received or on their own initiative.

The directories, due to the human component, have the following disadvantages with respect to search engines:

- greater slowness in updating the archives;
- reduced availability of information.

However, thanks to the strict page selection criteria adoption, to the hierarchical structure (or tree) and to the documentation organization, the directories allow, on the one hand, to have qualitatively superior information, on the other, to lead the user to precise and relevant results related to the interest topic, succeeding in many cases to avoid providing sites not responding to the research carried out.

2. SEO

Optimizing search engines literally means improving the ranking in search engine rankings within the returned results. To this end, all the techniques used to increase the website visibility are used, succeeding in proposing to the user results more pertinent to the research carried out. Since Google is the most used search engine in the world, most of the searches to improve

SEO activities concern the Google algorithm (PageRank) study. Google's position on SEO is expressed in the official website (Google, 2019):

“Advertising with Google will have no effect on your site's presence in our search results. Google never accepts money to include or position sites in its search results. Also, there is no cost to be included in Google's organic search results. Be wary of SEOs, agencies and web consultants who send unwanted emails ... No one can guarantee the achievement of the first position in Google's results”. The main elements underlying the process are the following two: the actions multiplicity to consider; the Search Engine Optimizer constant updating, to be pursued to keep up with technology.

The optimization activities implemented by the search engine optimizers are classified into two macro-areas (Enge, Spencer, Stricchiola,2015):

- the “on-page” activities, which concerns all those SEO activities that materialize within a website;
- the “off-page” activities, which concerns all the SEO activities carried out outside the website.

2.1. *SEO activities “on-page”*

The on-page practices are manifold, they concern the different aspects of a search engine and can be distinguished with respect to the optimization type (D. Vasta, 2012):

- Structure Optimization;
- Textual content Optimization.

To optimize the website structure, you must work mainly on the size and weight of the pages. The longer the waiting time, the greater the web site abandonment percentage. In fact, about ¼ of the users (25%) leave the web page if the waiting time is at least 15 seconds.

Moreover, specific SEO activity “on-page” is the textual contents optimization, relative to the choice of the following elements (Sciutto, Chioldino, Guzzi, Orlandi, & other,2017):

- web page title, on which the user will base his first judgment on the web page;
- the bold font, which highlights the most important terms, often coinciding with the content keywords;
- the keywords density, the keywords repetition in the text, the hidden links insertion, the doorway pages use, the software used to create links to support a page.

The “on-page” SEO techniques are very effective in achieving the goal immediately: it is common for the result to be temporary and subject to sudden changes, therefore constantly monitored to be constantly updated to reach the SERP (Search Engine Results Page) top.

2.2. *SEO activities “off-page”: the link popularity*

“Off-page” SEO activities are those practiced outside the website itself, because links are sought in other websites. “On page” activities are objective, because they use tangible techniques (choice of title, bold type, etc.), while “off-page” activities are subjective, because the activities depend on the web design professionalism, which establishes the best way to go from time to time. It is the link popularity mechanism, linked to the PageRank system, Google’s algorithm. Google is the number one search engine in the world. Specifically, link popularity refers to the number of backlinks (incoming links) that point to a given website. In contrast to domain popularity, every backlink is counted separately. Link popularity identifies the number of sites which link to a web page, that is, attaching importance to a website by putting a link from its website. Putting an external link means giving a “vote” to a good quality web resource. But the more a site will get a number of external links pointing to it, the more it will increase and improve its ranking in search results.

The path is not simple and obvious, because there are factors to be respected in Google (Taverniti, 2013):

- thematic nature of the website. In order to gain popularity, a website does not sometimes have to look at quantity, but rather at quality. In fact, sometimes even very few thematic links, even a single link, are enough to increase the positioning on the engine;
- time factor for the website Link Popularity. When working on the link popularity of your website, it is very good to increase the number of links pointing to the site, but you have to do it in a dosed and constant way. Google, in fact, very easily notices the increasing number of links and it is not usual to appreciate a sudden increase. If the website, before starting to work on link popularity does not present many backlinks (return links to your site), and then after a few days it presents a huge amount, you risk the opposite effect: worsening of the positioning.

3. Web Analytics

The Web Analytics is the statistical activity of measuring and analyzing the website performance and is used to understand the type of users who visit the website, the most interesting content and whether the goals set during its construction are achieved or not (Agostini, 2011).

According to the Web Analytics Association, Web Analytics is “...the measurement, collection, analysis and reporting of internet data for the purposes of understanding and optimizing web usage.”(Web Analytics Association , 2007). SEO and Web Analytics are interrelated: the measure of SEO work carried out is then analyzed through Web Analytics. For the analysis of the data it is necessary to have two elements :

- technological tools for collecting and measuring data, guaranteeing respect for the privacy and anonymity of visitors;
- the SEO skills to analyze the data collected and draw up reports able to provide guidelines to be followed in improving site optimization.

For the functioning of the instrument, visitors must be uniquely identified and the simplest way is to associate it with the IP address, also associating it with cookies. Fundamental in the website analysis is the identification of the most relevant metrics. For some sites, for example sites that contain sponsored ads and make money from the clicks users make on banners, a relevant parameter is the number of daily visits. Conversely, for a blog it may be more relevant to measure return visitors, or those users with whom a good degree of loyalty has been established (Kaushik, 2010). Information is collected through the use of specific software. The market offers various analysis tools, some of which are paid (such as Omniture, CoreMetrics or WebTrends), others, such as Google Analytics, which can be used free of charge. No traffic analysis tool is used by 34.9% of web sites. Google Analytics is used by 55.6% of all websites, or a market share of the 85.3% traffic analysis tool (W3Techs - World Wide Web Technology Surveys, 2019). For this reason Google Analytics is analyzed.

3.1. Google Analytics

Google Analytics is an analysis system for websites; a free Google service. To start using Google Analytics it is necessary to have a Google account and install a JavaScript code, to track each visitor. Once you log in to the system (www.google.com/intl/it/analytics), you need to configure the website in order to operate. When Google Analytics is active, data collection begins which can

be examined in the section called “Bulletin Board”. The features of Google Analytics are (Vasta,2012):

- a) Visitor analysis
- b) Analysis of traffic sources
- c) Content analysis
- d) Objectives analysis

The first two analyzes examine information coming from outside the site, instead the other two examine information inside the site.

- a) Visitor analysis

The visitors section contains various information, the most important informations are:

- number of visits: indicates the number of visits based on the sessions opened by visitors.
- number of absolute unique visitors: it represents the number of browsers that visited the site. Google Analytics defines the unique visitor as the user who accesses the site with the same account and the same browser;
- number of page views: it represents the number of times the track Page View function has been invoked, which is normally present only once inside each page;
- average of the pages viewed: it is given by the ratio between the number of total page views and the number of pages viewed in a predetermined time interval;
- site time: represents the average time that a user remains on the site;
- bounce rate: it is given by the ratio between the visits number of a page and the visits number in the selected period.

- b) Analysis of traffic sources

The traffic sources section contains various information, one of the most important is direct traffic, which indicates all the information relating to visitors who arrive at the site by directly entering the web address.

- c) Content analysis

This section deals with the monitoring of navigation paths and the success of the page contents. The validity and layout of the contents influence both the average visit time of the user and the bounce rate.

- d) Objectives analysis

The goal is defined, by Google Analytics, as any page on the site that users must reach and if this happens a conversion is obtained. The definitions of Google Analytics are:

- Objective: 1. URL destination: in this case the landing page URL is specified and the objective will be achieved only if the visitor reaches the specified page; 2. time on the site: this type provides information on

- the behavior of users within the site and expresses the degree of content satisfaction; 3. average pages per visit: the objective provides information about the user's involvement in the site;
- Objective value: indicates the objective importance, therefore the higher the value attributed to it, the greater the need to achieve conversion.

Conclusions

The most profitable relationship between the search engines and the SEO is to give visibility to the contents which respond exactly to the users' needs: the optimization is aimed at improving performance, architecture, usability and content, becoming an integral part of the experience of user. The SEO, which does not concern paid results, is also called pure or organic positioning. By contrast, the term SEA (Search Engine Advertising) is used exclusively to indicate pay per click advertising. SEO and SEA are both part of the web marketing macro-activity called SEM (Search Engine Marketing). The payment mechanism for sponsored links is PPC (Pay per Click), meaning the advertiser pays a certain amount each time a user clicks on his link.

In the future, the SEO challenge will be to address a multidisciplinary approach in which all aspects of technology, Search Engine Marketing, Social Media Marketing and Content Marketing will have to be integrated into optimal versions of Web Marketing (Maltraversi, 2016).

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