Search Engine Results Ranking System and Techniques to Increase Website Visibility *

Marek Kuruc
Slovenská technická univerzita v Bratislave
Fakulta informatiky a informačných technológií
xkuruc@stuba.sk

30. september 2023

Abstract

Search engines are powerful tools that help users find information on the web. They use various algorithms and techniques to crawl, index, optimalize and rank web pages based on their relevance and quality. However, not all web pages are equally visible to search engines, and some may be buried under millions of other results.

Therefore, web content creators and webmasters need to optimize their websites and content to increase their visibility and reach their target audience.

This document aims to explain the methods for increasing the website visibility, by first providing an overview of how search engines work, what factors affect their ranking, how are search engine sorting and optimalizing found results, in order to give an comprehensive explonation on how to align the website goals with the user needs and expectations. Then, it will describe some of the best practices and strategies that can be applied to improve the web design, content, keywords, links, and social media presence of a website. Finally, we will discuss some of the challenges and limitations of search engine optimization (SEO) and how to measure its effectiveness.

By following these guidelines, web content creators and webmasters can enhance their online presence and attract more visitors to their websites.

1 Introduction

In the contemporary digital landscape, search engines serve as the cornerstone of information discovery on the World Wide Web. These sophisticated tools use intricate algorithms and methodologies to traverse, catalog, optimize, and rank the vast expanse of web pages in accordance with their relevance and quality. Yet, not all web pages enjoy equal visibility. Many remain hidden beneath an avalanche of millions of other results, challenging the prospects of being discovered by users seeking information.

*Semestrálny projekt v predmete Metódy inžinierskej práce, ak. rok 2023/24, vedenie: Ing. Mohammad Yusuf Momand, MSc.

Consequently, web content creators and webmasters find themselves confronted with the request to enhance the visibility of their websites. This endeavor is essential for achieving alignment between the goals of a website and the expectations and needs of its target audience.

This document embarks on a comprehensible explanation of the mechanisms and techniques that underlie the augmentation of website visibility. Initially, it provides a foundational understanding of the inner workings of search engines, elucidating the factors influencing their ranking processes and the techniques employed for sorting and optimizing the results they yield. With this groundwork in place, we delve into an examination of the methods available to harmonize a website's objectives with the demands of its users.

Subsequently, this document delineates a compendium of best practices and strategies, encompassing aspects such as web design, content optimization, keyword selection, link building, and the cultivation of a robust social media presence. By elucidating these methodologies, we endeavor to empower web content creators and webmasters with the knowledge and tools necessary to fortify their digital presence.

Nonetheless, it is crucial to recognize that the realm of search engine optimization (SEO) is not without its challenges and constraints. We shall, therefore, broach the subject of the limitations inherent to SEO and explore methodologies for gauging its effectiveness, and at the end we will discuss the potential future of SEO.

2 How does seach engine search for information

In the following section, we will discuss the mechanisms of search engines. We will examine how they interpret user queries and navigate the vast digital landscape to retrieve relevant information. This process involves complex algorithms and data structures, which we will explain in detail

2.1 Crawling

Crawling is the process used by search engine web crawlers (also known as bots or spiders) to visit and download a page and extract its links in order to discover additional pages. Pages known to the search engine are crawled periodically to determine whether any changes have been made to the page's content since the last time it was crawled. If a search engine detects changes to a page after crawling a page, it will update its index in response to these detected changes. [1, p. 245] (paragraph B), [8] (Introduction)

Search engines use their own web crawlers to discover and access web pages. All commercial search engine crawlers begin crawling a website by downloading its robots.txt file, which contains rules about what pages search engines should or should not crawl on the website. The robots.txt file may also contain information about sitemaps- this contains lists of URLs that the site wants a search engine crawler to crawl. [8, p. 150] (Robots Exclusion Protocol)

Search engine crawlers use a number of algorithms and rules to determine how frequently a page should be re-crawled and how many pages on a site should be indexed. For example, a page that changes on a regular basis may be crawled more frequently than one that is rarely modified. [1, p. 248] (discussion)

When a search engine bot crawls a web page, it reviews all content and code that it can find. This includes plain text, images and alt text, links, etc. Crawlers note any links found on a site and crawl those pages too. In this way, site owners can create a link path for crawlers. [8, p. 154] (history of bias)

2.2 Indexing

After a page is crawled, the next step is to index its content. The indexed page is stored in a giant database, from where it can later be retrieved. Essentially, the process of indexing is identifying the words and expressions that best describe the page and assigning particular keywords to the page. The frequency of words is evaluated as well. For a human it will not be possible to process such amounts of information but generally search engines deal just fine with this task. [2, p. 2](Classical Indexing)

[7] [6] [4] [3] [5]

References

[1] Ioannis Avraam and Ioannis Anagnostopoulos. A comparison over focused web crawling strategies. 2011.

[2] Kamal EL GUEMMAT and Sara OUAHABI. Towards a new educational search engine based on hybrid searching and indexing techniques. 2019.

[3] Ashwini R. Gaurkhede and D. R. Dhotre. 2014 international conference on power, automation and communication (inpac). 2014. url: https://ieeexplore.ieee.org/document/6981154.

[4] S. Geetharani and M. Soranamageswari. Location-based ranking method (lbrm) for ranking search results in search engines. 2016. url:https://ieeexplore.ieee.org/document/7727140.

[5] Ayad Hameed Mousa, Mowafak Mohsen, Ali Alnasrawi, and Intedhar Nasir. Imuw-app: An instrument for measuring the usability of web applications. *Indonesian Journal of Electrical Engineering and Computer Science*, 24:1183, 11 2021.

[6] K. B. Jones. 2010. url:https://www.usetech.org/wp-content/uploads/ebooks/Search-Engine-Optimization-Your-Visual-Blueprint-for-Effective-Internet-Marketing.pdf.

[7] John B. Killoran. How to use search engine optimization techniques to increase website visibility. *IEEE Transactions on Professional Communication*, 56(1), 2013. url:https://ieeexplore.ieee.org/document/6463486.

[8] Yang Sun, Ziming Zhuang, Isaac G. Councill, and C. Lee Giles. Determining bias to search engines from robots.txt. 2007.