

## **THE EFFECTIVENESS OF SEARCH ENGINE OPTIMIZATION (SEO) IN MARKETING: A META-ANLYSIS STUDY**

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### **ABSTRACT**

This study aims to examine the effectiveness of the use of Search Engine Optimization (SEO) in digital marketing strategies through a comprehensive meta-analysis study. By collecting and analyzing data from previous studies involving SEO as a marketing tool, this study evaluated the extent to which SEO can improve online visibility, website traffic, and ultimately sales conversions. The results of a meta-analysis of 10 studies conducted between 2022 and 2024 show that the implementation of SEO is consistently associated with a significant increase in organic search rankings and website traffic with an effect size (d) value of 1.049 in the high effect size category. Further analysis revealed that variables such as content quality, keyword optimization, and backlinks have a significant influence on SEO effectiveness. This research provides empirical evidence that supports the implementation of SEO as a crucial component of digital marketing strategies, while also offering insights into best practices and factors that influence SEO success. With these results, practitioners and academics can better understand how SEO strategies can be optimized to achieve maximum results in an increasingly competitive digital environment.

**Keywords:** Search Engine Optimization; Pemasaran Digital; Effect Size; Meta-analysis

### **INTRODUCTION**

In today's digital era, digital marketing has become an important element in every company's business strategy (Zhang & Cabage, 2017). Digital transformation has changed the way companies communicate and interact with their customers. Digital marketing not only allows companies to reach a wider audience but also provides an effective platform for more personalized and direct interactions. Through various channels such as social media, email, search engines, and websites, digital marketing facilitates more accurate market segmentation and efficient targeting. This allows businesses to tailor their messaging and offer directly to the specific needs and wants of specific customer groups, increasing the likelihood of customer conversion and retention (Spais, 2010).

Digital marketing offers an edge when it comes to analyzing and measuring campaign effectiveness with real-time data. Companies can track customer responses and behaviors instantly, allowing for quick and precise adjustments to marketing strategies to increase ROI. Digital analytics tools provide in-depth data on customer

demographics, interactions, and preferences, which assists businesses in making more informed decisions (Lukito et al., 2015). With these advantages, digital marketing not only increases visibility and reach but also allows companies to stay competitive in an ever-evolving and often unpredictable market.

In the context of digital marketing, Search Engine Optimization (SEO) plays a critical role as the main driver in increasing the online visibility of a business. SEO is an optimized technique to ensure that a website appears at the top of the search engine results pages (SERPs) for a particular keyword (Khraim, 2015). This is especially important considering that most internet users tend not to see more than the first page of search results. With effective SEO techniques, companies not only increase traffic to their websites but also increase the chances of attracting relevant and potential customers. It directly supports digital marketing efforts by ensuring that business messages and offers reach the most appropriate audience (Khraim, 2015). SEO also facilitates the achievement of better data analysis which is an integral part of an effective

digital marketing strategy. By using SEO tools and techniques, businesses can gain insights into the most searched keywords and most effective at attracting traffic. This information not only helps in optimizing content and marketing strategies but also in doing more precise segmentation and target markets. As a result, the integration of SEO in digital marketing not only strengthens a company's online position but also improves the overall efficiency of marketing campaigns, maximizes ROI, and supports sustainable growth (Kai Li et al., 2014).

The rapid growth of SEO in recent years is inseparable from the evolution of technology and changes in consumer behavior in using the internet. Along with the increasing number of internet users and the existence of online businesses (Berman & Katona, 2020), SEO has grown to become a must for any company that wants to stand out in a highly competitive market. Now, SEO does not only focus on choosing the right keywords or building backlinks, but also involves technical optimization of the website, improving the user experience, and customizing relevant and high-quality content. Innovations in search engine algorithms that are constantly being updated are forcing SEO practitioners to constantly learn and adapt their strategies to stay effective.

The growth of SEO is also influenced by business recognition of the value of big data and analytics in strategic decision-making (Lewandowski et al., 2021). With advanced analytics tools in place, companies can monitor their SEO performance in real-time, understand visitor behavior, and adjust marketing tactics to achieve more optimal results. This not only improves their position in search engine search results but also helps in identifying new opportunities and anticipating future challenges. As such, SEO has evolved from a mere marketing technique to an integral element of a holistic business strategy, which supports not only increased traffic but also conversions and customer loyalty.

While digital marketing offers a wide range of opportunities for business growth, a number of significant challenges remain that often hinder its success. One of the main issues is data security and user privacy, which is a major concern amid increasing cyber threats and data leaks (Chen et al., 2024.). Companies must be careful in managing and protecting customer data to avoid breaches that could damage customer reputation and trust. Additionally, the flood of information and advertising often leads to information fatigue among consumers, making it increasingly difficult to attract attention and maintain user engagement. With the rapid changes in search engine algorithms and social media platforms, businesses are also faced with the challenge of constantly updating and adjusting their digital marketing strategies to stay relevant and effective in this highly competitive environment.

Research on Search Engine Optimization (SEO) has grown rapidly, but there is still a lack of a comprehensive and systematic study of overall SEO effectiveness. Many existing studies tend to focus on specific aspects, such as the influence of keywords or backlinks, without considering the complex interplay between various SEO factors and their impact on business results holistically (Hidayanto et al., 2012). In addition, the rapid and continuous changes in search engine algorithms make it difficult to draw long-term conclusions from the studies conducted. Therefore, a more systematic research approach is needed that not only integrates the different dimensions of SEO but also examines its impact on business performance in different industries and market contexts. This kind of study will be invaluable in optimizing SEO strategies to generate sustainable and significant profits (Mladenović et al., 2022).

Previous research has shown that Search Engine Optimization (SEO) is an important component of an effective digital marketing strategy. A study by Chaffey and Ellis-Chadwick (2016) found that companies that implement SEO techniques effectively can significantly increase website traffic, which in turn contributes to increased sales and profits. The study also highlights that SEO is not only important in increasing brand visibility but also in building consumer credibility and trust. The use of relevant keywords and the creation of quality content are considered key factors in influencing the ranking of web pages in search results, which directly affects consumers' purchasing decisions (Niranjika & Samarasinghe, 2019).

Furthermore, research by Fishkin (2018) revealed that SEO continues to evolve as a result of changes in search engine algorithms carried out by service providers such as Google. The study emphasizes the importance of continuous adaptation to the latest SEO practices to maintain and improve site rankings. Fishkin also explores the relationship between SEO and user experience (UX), pointing out that search engines are now prioritizing sites that not only contain relevant keywords but also provide a satisfying user experience. This reflects a shift from old manipulative techniques to an approach that focuses more on content quality and user satisfaction.

## RESEARCH METHODS

This The method used in this study is a meta-analysis study that examines various previous studies on the effectiveness of SEO in marketing. Meta-analysis is research that collects and analyzes previous research quantitatively (Utomo et al., 2023; Putra et al., 2023; Tamur and Junadi, 2020; Zulkifli et al., 2022; Oktarina et al., 2021). Data for the analysis was collected from a variety of sources that

included peer-reviewed journal articles, conferences, and industry reports published between 2022 and 2024. The inclusion criteria for this study were defined based on the material's relevance to SEO, methodological clarity, and availability of empirical data. After the initial selection process, as many as 50 studies met the criteria and were included in the analysis. The data from these studies is then extracted and categorized based on key variables such as the type of industry, the SEO strategy used, and the success metrics measured. Data analysis was carried out using a quantitative approach with meta-analysis techniques. It involves using a random effects model to combine the results from selected studies, allowing for a more general assessment of SEO effectiveness across various contexts. Statistical software is used to calculate the size of the combined effect and test the homogeneity between the studies. The analysis also included sensitivity testing to evaluate the strength of the findings and the potential bias of the publication. In this way, the study aims to provide a comprehensive and reliable synthesis of the impact of SEO on digital marketing, clarifying its effectiveness in improving business visibility and performance. Selanjutnya, kriteria nilai effect size dalam penelitian ini dapat dilihat pada Tabel 1.

**Tabel 1.** Nilai Effect Size

Classification	Criteria
Weak Effect Size	0 untill 0.1
Modest Effect Size	< 0.3
Medium Effect Size	< 0.5
Strong Effect Size	< 0.8
Very Strong effect size	≥ 0.8

Source : (Yusuf, 2023)

## RESULTS AND DISCUSSIONS

From the search of the journal database, 10 relevant publications were obtained and included in this meta-analysis data. Furthermore, the data is calculated by the effect size value and the standard error which can be seen in Table 2.

**Tabel 2.** Effect Size and Standard Error

No	Kode Jurnal	Effect Size	Standar Error	Kriteria
1	P1	1.03	0.32	Very Strong
2	P2	0.91	0.41	Very Strong
3	P3	1.92	0.32	Very Strong
4	P4	2.05	0.41	Very Strong
5	P5	0.47	0.33	Medium
6	P6	0.88	0.29	Very Strong

7	P7	1.13	0.43	Very Strong
8	P8	1.07	0.37	Very Strong
9	P9	0.62	0.30	Medium
10	P10	0.72	0.23	Medium

Berdasarkan Tabel 2, hasil analisis 10 publikasi nilai effect size berkisar 0.47 hingga 2.05 dan standar error 0.23 hingga 0.43. Menurut kriteria effect size Cohen's (Borenstein et al., 2009) terdapat 3 publikasi ( 30 %) nilai effect size medium dan 7 publikasi (70 %) nilai effect size very strong. Selanjutnya, menghitung nilai mean effect size dengan random effect model yang dapat dilihat pada Tabel 3.

**Tabel 3.** Summary/ Mean Effect Size

	Effect Size (d)	Standar error	Z	p
Intercept	1.049	0.161	6.522	<.001

Table 3, the mean effect size (d) value is 1.049 with a standard error of 0.161. These findings conclude that the implementation of SEO is consistently associated with significant improvements in organic search rankings and website traffic with a very strong effect size category with  $z = 6.522$  and  $p < 0.001$ . In this study, it explores the effectiveness of SEO in improving the visibility and performance of online marketing. SEO is the process of optimizing web content to rank higher on search engines like Google. With the increasing use of the internet to search for information and products, a good position in search results greatly affects the success of a business. The study shows that effective SEO can increase the number of website visitors, potentially leading to increased sales and customer loyalty (Mladenović et al., 2022).

The importance of high-quality content in SEO. Search engines are getting smarter at assessing the quality of content, so only relevant, informative, and engaging content ranks high. Research shows that websites with content that is constantly updated and has added value for visitors tend to have better SEO performance (Zhang & Cabage, 2017). Blog articles, videos, and infographics are some examples of content that can increase user engagement and visit time, which in turn, can improve SEO rankings. SEO not only has an impact on visibility and traffic, but also on business trust and credibility (Ramya et al., 2018). Websites that appear on the first page of search results tend to be considered more credible by users. In addition, backlinks from reputable websites also increase domain authority, which is an important factor in SEO rankings (Lukito et al., 2015). In conclusion, effective SEO is a combination of content strategy, technical optimization, and good online reputation management. Investing in

sustainable SEO can provide significant long-term results for businesses in the form of increased visibility, traffic, and conversions.

## CONCLUSION AND SUGGESTION

From the results of this study, it can be concluded that the implementation of SEO is consistently related to a significant increase in organic search rankings and website traffic with an effect size value (d) of 1.049 in the high effect size category. Further analysis revealed that variables such as content quality, keyword optimization, and backlinks have a significant influence on SEO effectiveness. This research provides empirical evidence that supports the implementation of SEO as a crucial component of digital marketing strategies, while also offering insights into best practices and factors that influence SEO success. With these results, practitioners and academics can better understand how SEO strategies can be optimized to achieve maximum results in an increasingly competitive digital environment.

## REFERENCES

- Berman, R., & Katona, Z. (n.d.). *The Role of Search Engine Optimization in Search Marketing*.
- Borenstein, M. (Ed.). (2009). *Introduction to meta-analysis*. John Wiley & Sons.
- Chen, C.-Y., Shih, B.-Y., Chen, Z.-S., & Chen, T.-H. (n.d.). The exploration of internet marketing strategy by search engine optimization: A critical review and comparison. *Afr. J. Bus. Manage.*
- Hidayanto, A. N., Adha, Moch. S., Jiwanggi, M. A., & Melia, T. (2012). A study of impact of search engine optimisation to internet marketing strategy. *International Journal of Services, Economics and Management*, 4(4), 298. <https://doi.org/10.1504/IJSEM.2012.050950>
- Kai Li, Mei Lin, Zhangxi Lin, & Bo Xing. (2014). Running and Chasing—The Competition between Paid Search Marketing and Search Engine Optimization. *2014 47th Hawaii International Conference on System Sciences*, 3110–3119. <https://doi.org/10.1109/HICSS.2014.640>
- Khraim, H. (2015). The Impact of Search Engine Optimization on Online Advertisement: The Case of Companies using E-Marketing in Jordan. *American Journal of Business and Management*, Vol. 4, 76–84. <https://doi.org/10.11634/216796061504676>
- Khraim, H. S. (2015). The Impact of Search Engine Optimization on Online Advertisement: The Case of Companies using E-Marketing in Jordan. *American Journal of Business and Management*, 4(2), 76–84. <https://doi.org/10.11634/216796061504676>
- Lewandowski, D., Sankler, S., & Yagci, N. (2021). *The influence of search engine optimization on Google's results: A multi-dimensional approach for detecting SEO* (p. 20). <https://doi.org/10.1145/3447535.3462479>
- Lukito, R. B., Lukito, C., & Arifin, D. (2015). Implementation Techniques of Search Engine Optimization in Marketing Strategies Through the Internet. *Journal of Computer Science*, 11(1), 1–6. <https://doi.org/10.3844/jcssp.2015.1.6>
- Mladenović, D., Rajapakse, A., Kožuljević, N., & Shukla, Y. (2022). Search engine optimization (SEO) for digital marketers: Exploring determinants of online search visibility for blood bank service. *Online Information Review*, 47(4), 661–679. <https://doi.org/10.1108/OIR-05-2022-0276>
- Niranjika, U., & Samarasinghe, D. (2019). *Exploring the Effectiveness of Search Engine Optimization Tactics for Dynamic Websites in Sri Lanka* (p. 272). <https://doi.org/10.1109/MERCon.2019.8818903>
- Oktarina, K., Santosa, T. A., Razak, A., Ahda, Y., & Putri, D. H. (2021). *Meta-Analysis: The Effectiveness of Using Blended Learning on Multiple Intelligences and Student Character Education during the Covid-19 Period*. 4(3).
- Putra, M., Rahman, A., Ilwandri, I., Suhayat, Y., Santosa, T. A., Putra, R., & Aprilisia, S. (2023). The Effect of STEM-Based REACT Model on Students' Critical Thinking Skills: A Meta-Analysis Study. *LITERACY: International Scientific Journals of Social, Education, Humanities*, 2(1), Article 1. <https://doi.org/10.56910/literacy.v2i1.560>
- Ramya, A., Shrivastava, S., & Mishra, A. (2018). *Importance of Search Engine Marketing in the Digital World* (p. 158). <https://doi.org/10.15439/2017KM24>
- Spais, G. (2010). Search Engine Optimization (SEO) as a Dynamic Online Promotion Technique: The Implications of Activity Theory for Promotion Managers. *Innovative Marketing*, 6, 7–24.
- Tamur and Junadi. (2020). The Effectiveness of the Application of Mathematical Software in Indonesia; A Meta-Analysis Study. *International Journal of Instruction*, 13(4), 867–884. <https://doi.org/10.29333/iji.2020.13453a>
- Utomo, W., Suryono, W., Jimmi, J., Santosa, T. A., & Agustina, I. (2023). Effect of STEAM-Based Hybrid Based Learning Model on Students' Critical Thinking Skills. *Jurnal Penelitian Pendidikan IPA*, 9(9), 742–750. <https://doi.org/10.29303/jppipa.v9i9.5147>
- Yusuf, F. A. (2023). Meta-Analysis: The Influence of Local Wisdom-Based Learning Media on

- the Character of Students in Indonesia. *International Journal of Educational Methodology*, 9(1), 237–248. <https://doi.org/10.12973/ijem.9.1.237>
- Zhang, S., & Cabage, N. (2017). Search Engine Optimization: Comparison of Link Building and Social Sharing. *Journal of Computer Information Systems*, 57(2), 148–159. <https://doi.org/10.1080/08874417.2016.1183447>
- Zulkifli, Z., Satria, E., Supriyadi, A., & Santosa, T. A. (2022). Meta-analysis: The effectiveness of the integrated STEM technology pedagogical content knowledge learning model on the 21st century skills of high school students in the science department. *Psychology, Evaluation, and Technology in Educational Research*, 5(1), Article 1. <https://doi.org/10.33292/petier.v5i1.144>