

Enhancing Website Marketing Through Effective Seo Strategies: A Case Study of Entrefine

Rico Ferdinand¹, Angga Aditya Permana^{2*}

^{1,2}Department of Informatics, Faculty of Engineering and Informatics, Universitas Multimedia Nusantara, Banten, Indonesia
¹rico.ferdinand@student.umn.ac.id, ^{2*}angga.permana@umn.ac.id

Abstract

The Industrial Revolution 4.0 has influenced consumer behavior, as they use the internet to seek information. This has led to businesses shifting their marketing strategies towards digital marketing. Entrefine sells products such as data management analysis systems and Excel training for corporate employees. One crucial aspect to consider is the high number of companies selling similar products, resulting in fierce competition among businesses. The solution to this problem is to design and develop a new website as an information system to offer Excel training services, enhance management efficiency and cost-effectiveness, and implement SEO on the website to improve its search engine rankings, thereby increasing the chances of attracting internet users. The System Development Life Cycle (SDLC) method using the Waterfall model is employed in website development, as it is suitable for systems with low complexity, ensuring well-scheduled and easily controlled project execution. The built system can be deemed successful as the website scored 100% in functionality testing and operates smoothly. The implementation of SEO has proven to be effective, generating a total of 341 traffic and achieving an average ranking of 8.4 within a short period.

Keywords: Digital Marketing, SEO, Waterfall, Website.

©This work is licensed under a Creative Commons Attribution - ShareAlike 4.0 International License

1. Introduction

The development of the Industrial Revolution 4.0 has transformed consumer behavior, as they now utilize the internet as the primary means to gather information before purchasing specific products or services [1]. This phenomenon has brought consequences to business marketing strategies, which have now adopted a digital approach to promote products or services to consumers, known as digital marketing. One popular form of digital marketing is through e-commerce websites [2].

Currently, buying and selling activities are predominantly conducted through web applications and have become a trend in the era of globalization. Both buyers and sellers benefit from online shopping in various ways. From the buyer's perspective, online transactions offer convenience, time savings, and practicality. Customers can even compare products by searching through catalogs via email or websites. Simultaneously, from the seller's perspective, it becomes easier to reach potential buyers [3,4].

Entrefine is a local company founded in 2020 by Michael Tanfebri and Calvin Lim. Entrefine conducts its sales through various online platforms, one of which is their website. They sell products such as data management analysis systems and Excel training for corporate employees. One crucial aspect to consider is the high number of companies selling similar products, leading to fierce competition among businesses. Various companies in Indonesia with similar products strive to enhance their online transaction activities by implementing effective strategies.

Entrefine has a main website that serves as a platform for selling the company's products. However, the

website is not functional and lacks maintenance, resulting in a lack of visitors. The solution to this problem is to design and develop an e-commerce website using the System Development Life Cycle (SDLC) [4-8] methodology with the waterfall model as an information system to offer training services. This approach aims to assist management in improving efficiency and cost-effectiveness, as well as implementing SEO on the website to enhance its search engine rankings, thereby increasing the chances of attracting internet users. This website is also useful in increasing the possibility of monopolizing search engines, resulting in having two websites featured in search engine results [9,10].

Internet users generally rely on search engines to find the information they need. Overall, around 62% of internet users show interest in the first 10 or 20 pages on page one and two of the Search Engine Result Page (SERP), while the remaining 38% look at websites appearing on subsequent pages [11]. Therefore, website owners strive to ensure that their company's website ranks at the top or at least appears on the first page of search results based on targeted keywords. When an online sales site ranks highly on SERP, the chances of visitor traffic and transactions increase [12].

Research conducted by [13] uses search engine marketing (SEM) techniques with SEO to further optimize digital marketing widely. In addition to being used for digital marketing, in research [14] SEO is also used to increase visitor traffic on the Open Journal System (OJS) so that many articles can be read and accessed by many people.

However, how can a well-designed website structure that is also SEO-friendly be created to be easily

recognized by search engines. On-page and off-page SEO techniques should be applied to the designed and developed website to enable management to publish and sell products effectively, thereby expanding marketing efforts and achieving better product sales. Additionally, search engines need to recognize the structure of the website to attract visitors [15-17]. Search engine optimization methods, both on-page and off-page, are based on official Google guidelines.

2. Research Methods

This research consists of several stages in designing an e-commerce website using the SDLC methodology, with a modeling approach based on the waterfall model, as done by [18] this method is used to build a message security application, also done by [19] by building an application to be able to predict the needs of car consumers, with the waterfall method the applications were successfully built well. The research methodology involves several stages, starting from system design, system implementation, system testing, and concluding with system maintenance.

A. Requirement Analysis

In this phase, planning is conducted to determine the requirements needed for the development of this E-commerce website. The design of the marketing site encompasses both user and admin functionalities. Users are able to view offered products, make purchases, and read blog articles, while admins can write and edit articles on the blog.

B. Design System

This phase is also known as the blueprint phase. It involves producing prototypes such as designs, patterns, components, and so on. The creation of flowcharts, use case diagrams, and site maps (sitemap) is performed as part of the design process.

C. Implementation

This website was built using Visual Studio code with HTML, CSS and JavaScript programming languages, and at this stage we also implemented SEO which was carried out on this website, namely Onpage SEO and Off-page SEO in the form of Keyword Research, Title/Meta Tag, Meta Description, XML Sitemap, FAQ Schema, Article Optimization, Backlinks, and Request Indexing.

D. Testing System

Once the website is created using the desired system, testing is conducted to ensure the system functions properly, identify any bugs or errors, and verify if the system functions as expected. Corrections for errors or bugs can be made using black box testing methods.

E. Maintenance System

The final stage in the waterfall method is maintenance. During this stage, system maintenance tasks are performed, such as adding program features or

addressing errors or bugs reported by users during site usage. Maintenance is conducted periodically to ensure the system remains optimal.

3. Result and Discussion

At this stage, we try to explain the results and discussions that we have done in this research.

A. Requirement Analysis

At this stage, problems are identified on the Entrefine website. Identification of problems focuses on the website that will be built and is new so that it is not available in search engines and cannot be found by internet users.

B. Design System

System design is carried out to design the website that will be created with interface model design and also sitemap design for the website.

Design Interface

In this section, the implementation results of the interface design on the website's pages are explained.

a. Home

The Home page of the website displays the website's header with a logo integrated into the background image. Users can click a button to navigate to the blog, find general information about the company, and explore the products offered. By clicking on product images, readers will be directed to the product sales section on the main company website. Testimonials from customers who have purchased the company's products are also featured. The implementation result of the Home page on this website can be seen in Figure 1.

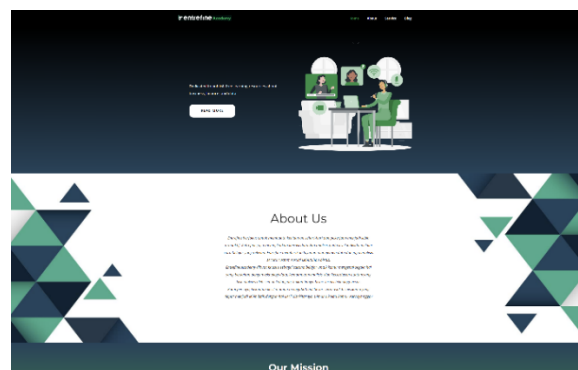


Figure 1. Home Page

b. Service

The interface design for the Service page can be seen in Figure 2. On this page, users can request consultations by clicking a button in the page header. Users can also see the list of clients who have worked with Entrefine, reasons to choose Entrefine, and participant testimonials. There is also a section displaying training programs with buttons that lead users to PDF files stored on Google Drive, providing detailed information about the training programs. Additionally, users can view a section that explains the profiles of trainers who conduct Excel training.

On the Service page, there is information about the training services offered, including past clients, reasons to choose Entrefine, participant testimonials, offered training programs, the advantages of Entrefine Learning, and trainer profiles. The implementation result of the Service page can be seen in Figure 2.

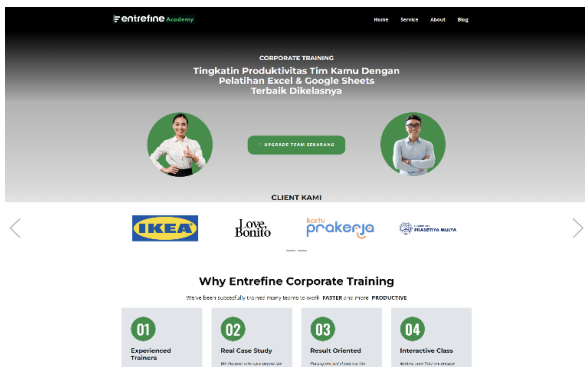


Figure 2. Service Page

c. About

The About page provides further explanations about the company, including its vision, mission, CEO Letter, the products offered, and FAQs about the company. The implementation result of the About page can be seen in Figure 3.

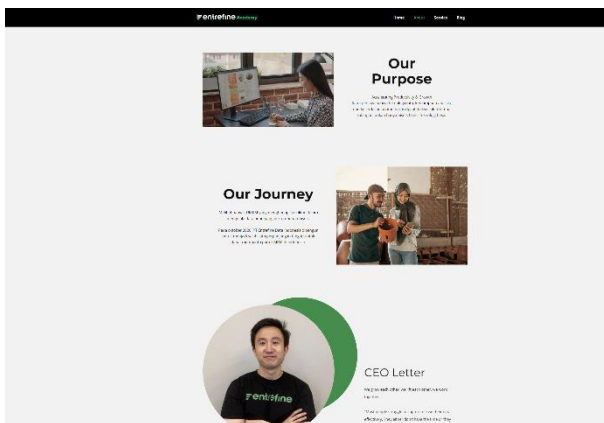


Figure 3. About Page

d. Home in Blog

The Home page of the Blog section displays all published articles, with the latest article at the top. The implementation result of the Home page in the Blog section can be seen in Figure 4.

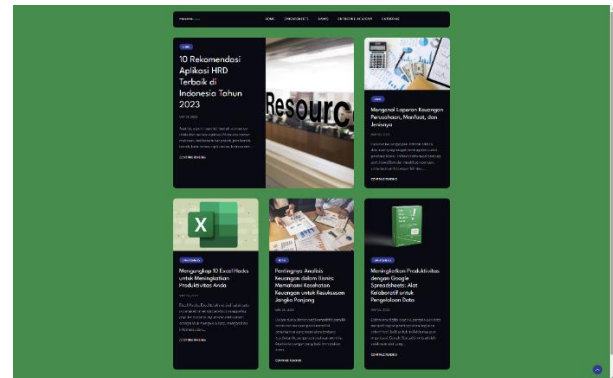


Figure 4. Blog's Home

e. Spreadsheets in Blog

The Spreadsheets page in the blog showcases articles categorized under spreadsheets that have been published, with the latest article at the top. The implementation result of the Spreadsheets page in the Blog section can be seen in Figure 5.

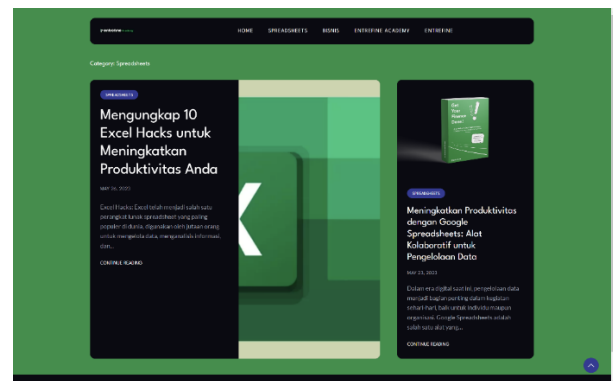


Figure 5. Blog's Spreadsheet Page Design Interface

f. Business in Blog

The Business page in the Blog section presents articles categorized under business that have been published, with the latest article at the top. The implementation result of the Business page in the Blog section can be seen in Figure 6.

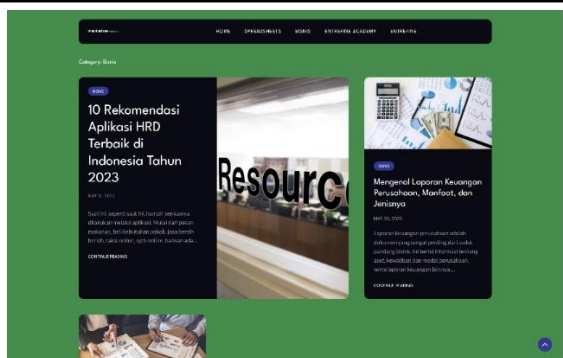


Figure 6 Blog's Business Page Design Interface

Sitemap

This website consists of four main pages, namely Home, Service, Blog, and About. The Home page serves as the main page of the website, the Service page provides explanations about the training services offered, the About page contains information about the company profile, and the Blog page directs users to the blog website created in a subfolder of this website. The sitemap of this website can be viewed in Figure 7.

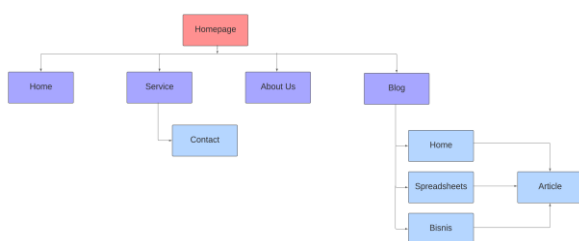


Figure 7. Website Sitemap

C. Implementation

1. Implementation of Keyword Research

Entrefine utilizes trending keywords to expedite achieving higher rankings on SERPs. One example of a keyword used is "financial analysis," which was searched using the Ubersuggest tool. Based on Figure 8, the keyword "financial analysis" has a keyword difficulty score of 37, indicating low competition compared to keywords with difficulty scores above 80. It also has a high search volume, averaging 1,600 searches in Indonesia on search engines.

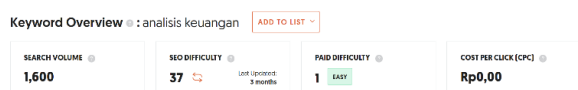


Figure 8. Keyword Research "financial analysis"

Keywords are inserted on each page of the website with different variations. Keyword placement on the website is done using HTML, as seen in Figure 9.

```
<meta name="keywords" content="Entrefine, Entrefine academy, entrefineacademy, solusi laporan keuangan, sistem laporan keuangan terlengkap, laporan keuangan, penyedia laporan keuangan">
```

Figure 9. Keyword Implementation

The result of keyword placement on the website can be seen in Figure 10, where the keywords are detected by Google.

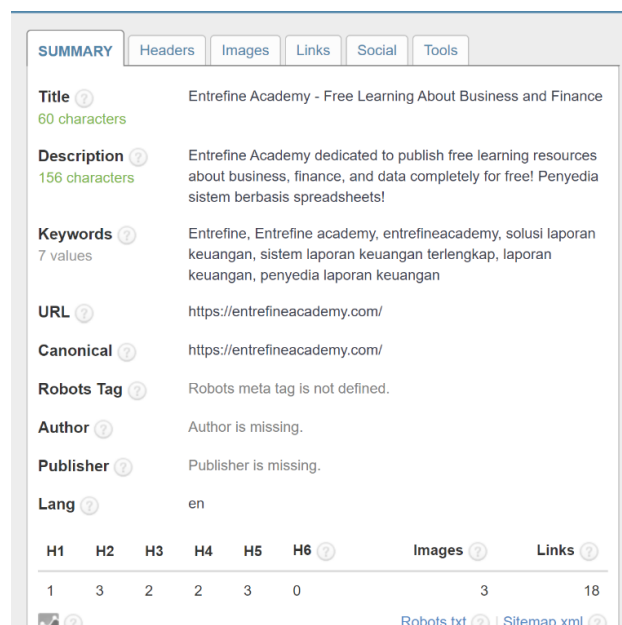


Figure 10. Result of Keyword Placement

2. Implementation of Title Tags/Meta Tags

The implementation of title tags on the Entrefine website is done using HTML can be seen in Figure 11, adhering to the rule of a maximum of 60 characters to ensure that the entire title is visible in search engine results without being truncated. The main keywords are also included in the title tags to boost the website's ranking on search engines.

```
<title>Entrefine Academy - Free Learning About Business and Finance</title>
```

Figure 11. Title Tag/Meta Tag Implementation

The result of the title tag implementation can be seen in Figure 13 when the website appears in search engine results.

3. Meta Description Implementation

The implementation of meta descriptions on the Entrefine website follows the rule of a maximum length of 160 characters. The implementation of meta descriptions can be seen in Figure 12.

```
<meta name="description" content="Entrefine Academy dedicated to publish free learning resources about business, finance and data completely for free! Penyedia sistem berbasis spreadsheets!">
```

Figure 12. Meta Description Implementation

The limited length of the meta description aims to attract readers with concise yet comprehensive explanations, thereby increasing clicks and impressions on the Entrefine website. The result of meta description placement can be seen in Figure 13 when the website appears in search engine results.

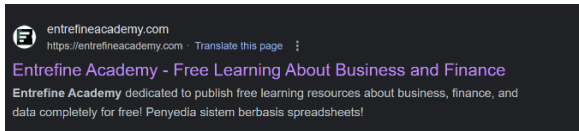


Figure 13 Result of Meta Description Implementation

4. Sitemap XML

XML Sitemap is beneficial for facilitating visitor navigation, expediting search engine indexing, and enhancing the visibility of the website on search engines. The implementation of XML Sitemap for the Entrefine website can be seen in Figure 14, which includes every page of the website.

```
C:\Users> ricol > OneDrive > Documents > Nicepage Templates > Site1 > sitemap.xml
1 <?xml version="1.0" encoding="UTF-8"?>
2 <urlset xmlns="http://www.sitemaps.org/schemas/sitemap/0.9">
3
4   <url>
5     <loc>https://entrefineacademy.com/</loc>
6     <priority>1.0</priority>
7     <lastmod>2023-06-08</lastmod>
8     <changefreq>hourly</changefreq>
9   </url>
10
11  <url>
12    <loc>https://entrefineacademy.com/Corporate-Training</loc>
13    <priority>1.0</priority>
14    <lastmod>2023-06-08</lastmod>
15    <changefreq>hourly</changefreq>
16  </url>
17
18  <url>
19    <loc>https://entrefineacademy.com/About</loc>
20    <priority>1.0</priority>
21    <lastmod>2023-06-08</lastmod>
22    <changefreq>hourly</changefreq>
23  </url>
24
25  <url>
26    <loc>https://entrefineacademy.com/Contact</loc>
27    <priority>1.0</priority>
28    <lastmod>2023-06-08</lastmod>
29    <changefreq>hourly</changefreq>
30  </url>
31
32  <url>
33    <loc>https://entrefineacademy.com/blog</loc>
34    <priority>1.0</priority>
35    <lastmod>2023-06-08</lastmod>
36    <changefreq>hourly</changefreq>
37  </url>
38
39 </urlset>
```

Figure 14. Sitemap XML Implementation

5. FAQ Schema Implementation

The implementation of FAQ Schema can be seen in Figure 15, created using JavaScript. The code contains relevant questions and answers related to the content discussed in the articles.

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "FAQPage",
  "mainEntity": [{
    "@type": "Question",
    "name": "Apa itu Aplikasi HRD?",
    "acceptedAnswer": {
      "@type": "Answer",
      "text": "Aplikasi HRD / HRM / HRMS atau Human Resources Management System adalah merupakan salah satu bentuk inovasi teknologi HR Management System yang hadir untuk memberikan solusi untuk mempermudah pengelolaan data dan sumber daya manusia di sebuah perusahaan."
    }
  }],
  [{"@type": "Question",
    "name": "HRD mengurus apa saja?",
    "acceptedAnswer": {
      "@type": "Answer",
      "text": "HRD bertugas untuk melakukan persiapan dan seleksi tenaga kerja, mulai dari persiapan yang meliputi faktor internal dan eksternal, rekrutmen tenaga kerja, dan seleksi tenaga kerja."
    }
  }
]}
</script>
```

Figure 15. FAQ Schema Implementation

6. Table of Content Implementation

The implementation of the table of contents can be seen in Figure 16, created using HTML to provide readers with an overview of what an article covers.

```
<div id="toc_container">
<h2><strong>Daftar Isi</strong></h2>
<ul class="toc_list">
<li><a href="#1">Human Resources Tools by Entrefine</a></li>
<li><a href="#2">Mekari Talenta</a></li>
<li><a href="#3">Gadjian</a></li>
<li><a href="#4">LinovHR</a></li>
<li><a href="#5">HRD Pintar</a></li>
<li><a href="#6">Manataal</a></li>
<li><a href="#7">KaryaOne</a></li>
<li><a href="#8">Catapa</a></li>
<li><a href="#9">onHRD</a></li>
<li><a href="#10">ForwardHRD</a></li>
<li><a href="#11">Kesimpulan</a></li>
</ul>
</div>
```

Figure 16. Table of Content Implementation

7. Backlink Implementation

The implementation of backlinks on the Entrefine website is divided into two types: blog comment backlinks, achieved by leaving comments on blog pages, and forum discussions, involving discussions or comments on other users' threads.

i. Blog Comment Backlink

The implementation of blog comment backlinks can be seen in Figure 17.

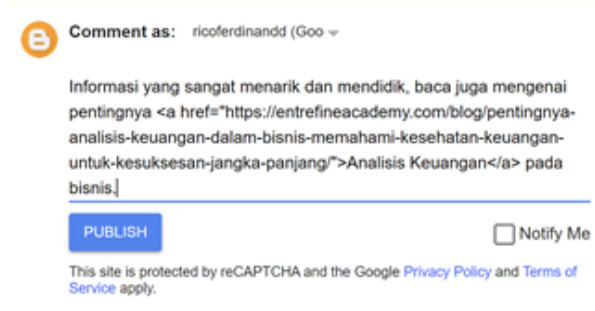


Figure 17. Blog Comment Backlink Implementation

In the comment, the keyword "financial analysis" is selected as the anchor text, linking it to an article on the Entrefine blog using HTML. The result of the blog comment implementation can be seen in Figure 18, where the keyword "financial analysis" now has a URL that directs readers to the targeted article.

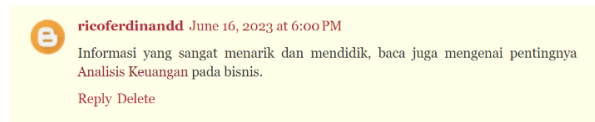


Figure 18. Result of Blog Comment Backlink Implementation

j. Forum Discussion Backlink

The implementation of forum discussions can be seen in Figure 19.

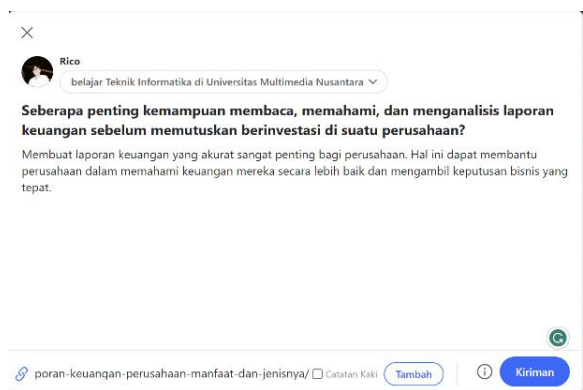


Figure 19. Forum Discussion Backlink Implementation

The chosen keyword is "financial report," with a URL added to the keyword to create a footnote that leads to an Entrefine article discussing financial reports. The result of the forum discussion implementation can be seen in Figure 20, where the keyword "financial report"

has a footnote, and below the comment in the forum, there is a URL directing readers to the targeted article.

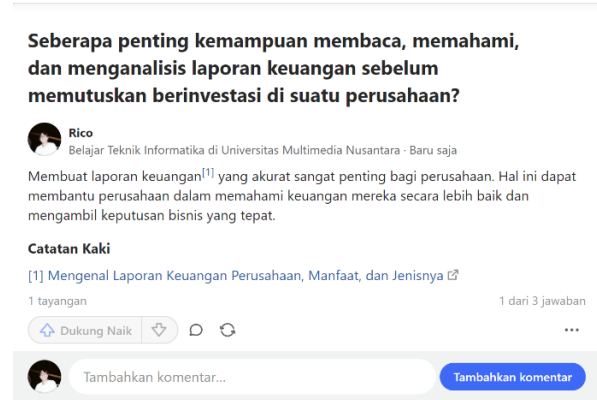


Figure 20. Result of Forum Discussion Backlink Implementation

8. Request Indexing Implementation

The implementation of indexing can be seen in Figure 21. Indexing is performed using the Google Search Console tool to inform Google about new pages or changes to existing pages on the website, ensuring that these pages appear in search engine results.

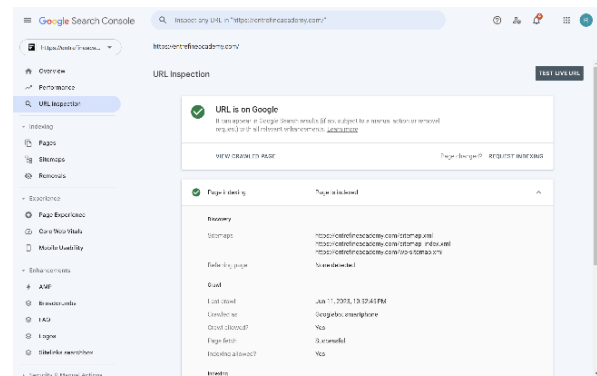


Figure 21. Request Indexing Implementation

D. Testing System

This section discusses the results of the system's functional testing using black box testing and also the outcomes of the SEO implementation.

a. System Functionality Test

The system's functional testing was conducted using the black box testing method, as shown in Table 1. The testing involved 30 respondents, with each respondent attempting the Entrefine website once. The Entrefine website was distributed through Google Drive.

Table 1. Black Box Testing

No	Testing Description	Expected Result	Result	Score
1	Go to the home page	The entire home page appears without errors	The Home page opens	Valid
2	Go to the about page	The about page appears in its entirety without error	The about page opens	Valid
3	Access the service page	A page offering training services appears	The service page opens	Valid
4	Purchasing excel training services	A contact page appears to make a consultation	The contact page opens	Valid
5	Press whatsapp button on contact page	A page appears to chat on whatsapp	The page to chat on whatsapp opens	Valid
6	View training program details	A pdf file page appears regarding the details of the training program	Pdf file page opens	Valid
7	Access the blog page	The blog page appears and there are articles that have been posted on it	Blog page opens	Valid
8	Access featured articles from the main page of the blog	Open the details of a featured article	The article page opens	Valid
9	Access featured articles from the Spreadsheets menu	Open the details of a featured article	The article page opens	Valid
10	Access featured articles from the business menu	Open the details of a featured article	The article page opens	Valid
11	Access the home page from the EntrefineAcademy menu	The entire home page appears without errors	The home page opens	Valid

b. Results of SEO Implementation

As seen in Figure 22, the Entrefine Academy website received a total of five clicks, was viewed by readers 341 times, and achieved an average rank of 8.4 for keywords associated with the Entrefine Academy website. These results were obtained by implementing basic SEO techniques within one month after the SEO implementation.

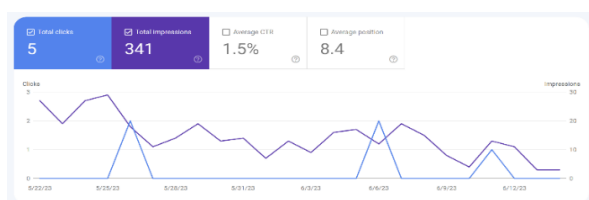


Figure 22. Results of SEO Implementation

4. Conclusion

The data technology marketing website has been successfully designed and built by implementing the system development life cycle (SDLC) methodology with the waterfall model in producing website-based marketing tools. Based on the functionality test, the website scored 100% and can run well. Then, the SEO

implementation used proved effective, by generating traffic of three hundred and forty-one, within one month after SEO was implemented and getting an average ranking of eight point four on the keywords contained in the EntrefineAcademy website. This indicates that if SEO implementation is carried out continuously on the website, and the website posts more articles, the website can generate more traffic.

Due to the limitations of this study, there are several findings that can be improved by further researchers, such as: The implementation of SEO only covers On-Page and Off-Page SEO. The next development is that technical SEO can be implemented so that SEO implementation can be carried out more effectively. The EntrefineAcademy website is not supported by Accelerated Mobile Pages (AMP) so that readers who open the website using mobile devices get a high page load. The next development can change the website so that it is supported by AMP. The entrefine business process still uses human power to conduct consultations. The next development is to be able to add AI as a chatbot to be able to conduct consultations on the website page.

Acknowledgements

The authors would like to thank Universitas Multimedia Nusantara for their support of this research work.

References

- [1] U. M. D. E. C. D. E. Los, 2010 “No 主観的健康感を中心とした在宅高齢者における健康関連指標に関する分散構造分析Title.”.
- [2] V. G. Shabrina, 2019, “Pengaruh Revolusi Digital terhadap Pemasaran dan Perilaku Konsumen,” *J. Pewarta Indones.*, vol. 1, no. 2, pp. 113–120, doi: 10.25008/jpi.v1i2.16.
- [3] D. Chaffey and D. Bosomworth, 2013, “Digital marketing strategy planning template,” *Smart Insights*, no. January, pp. 1–14, [Online]. Available: <http://www.enterprisebucks.co.uk/wp-content/uploads/2014/09/digital-marketing-plan-template-smart-insights1.pdf>
- [4] D. Nurnaningsih, A. A. Permana, S. Ramadhina, and A. Rodoni, 2020, “Designing shiyam application: An android-based fasting reminder,” *Int. Conf. Electr. Eng. Comput. Sci. Informatics*, vol. 2020-Octob, no. October, pp. 60–64, doi: 10.23919/EECSI50503.2020.9251891.
- [5] A. A. Permana, R. Taufiq, and S. Ramadhina, 2020, “Prototype design of mobile application ‘hydrolite’ for hydroponics marketplace,” *Int. Conf. Electr. Eng. Comput. Sci. Informatics*, vol. 2020-Octob, no. October, pp. 45–48, doi: 10.23919/EECSI50503.2020.9251303.
- [6] A. A. Permana *et al.*, 2023, *Software Development Life Cycle*. doi: 10.1007/978-1-4842-9514-4_3.
- [7] R. Taufiq, R. R. Ummah, I. Nasrullah, and A. A. Permana, 2019, “Rancang Bangun Sistem Informasi Penggajian Pegawai Berbasis Web di Madrasah Ibtidaiyah Nurul Huda Kota Tangerang,” *J. Inform. Univ. Pamulang*, vol. 4, no. 4, p. 119, doi: 10.32493/informatika.v4i4.3951.
- [8] R. A. Suherdi, R. Taufiq, and A. A. Permana, 2018, “Penerapan Metode AHP dalam Sistem Pendukung Keputusan Kenaikan Pangkat Pegawai Di Badan Kepegawaian Dan Pengembangan Sumber Daya Manusia Kota Tangerang,” *Sintak*, pp. 522–528, [Online]. Available: <https://www.unisbank.ac.id/ojs/index.php/sintak/article/view/6667>
- [9] Urmila, E. Sastrawan, and H. W. Adda, 2023, “Penerapan Teknik Seo (Search Engine Optimization) pada WebsitePikiran-Rakyat.Com dalam Strategi Pemasaran,” *Jumek J. Manaj. dan Ekon. Kreat.*, vol. 1, no. 3, pp. 50–56.
- [10] Sintha Erika Putri and Budi Prabowo, 2023, “Penerapan Search Engine Optimization (SEO) Pada Strategi Digital Marketing UMKM,” *Nusant. J. Pengabd. Kpd. Masy.*, vol. 3, no. 3, pp. 123–131, doi: 10.55606/nusantara.v3i3.1452.
- [11] R. B. Halilintar and D. Ariyus, 2018, “Implementasi Seo (Search Engine Optimization) Pada Website Agc (Auto Generated Content) Untuk Meningkatkan Serp (Search Engine Result Page) Studi Kasus : Website Gallery,” *Semnasteknomedia Online*, vol. 6, no. 1, pp. 1–3–13, [Online]. Available: <https://ojs.amikom.ac.id/index.php/semnasteknomedia/article/view/2065>
- [12] D. Istiqomah, 2020, “Strategi Internet Marketing Optimasi Website Sebagai Metode Peningkatan Penjualan Produk Di Jasalogo.Id Ponorogo,” pp. 1–102.
- [13] Aarchi Panchal, Akshita Shah, and Krishna Kansara, 2021, “Digital Marketing - Search Engine Optimization (SEO) and Search Engine Marketing (SEM),” *Int. Res. J. Innov. Eng. Technol.* (, vol. 5, no. 12, pp. 17–21.
- [14] S. N. Husin, P. Edastama, and A. Tambunan, 2022, “Digital Marketing Strategy using White Hat SEO Techniques,” *Int. J. Cyber IT Serv. Manag.*, vol. 2, no. 2, pp. 171–179, doi: 10.34306/ijcitsm.v2i2.118.
- [15] Y. D. Pramudita, H. Huzaini, and F. Solihin, 2019, “Penerapan Metode Seo on Page Dan Off Page Pada Web Penjualan Online Untuk Meningkatkan Ranking Serp,” *Netw. Eng. Res. Oper.*, vol. 4, no. 2, pp. 125–133, doi: 10.21107/nero.v4i2.128.
- [16] A. Akbar, I. Sulistianingsih, F. H. Syam, and B. Kurniawan, 2022, “Implementation of On-Page and Off Page SEO to Improve Tourism Promotion Websites,” *Int. Conf. Sci. Dev. Technol.*, vol. 2, no. 1, pp. 269–276.
- [17] A. Ghulam, M. Hyder, S. Rahu, M. H. Depar, and S. Rahu, 2017, “On-Page Search Engine Optimization (SEO) Techniques Model: A Use Case Scenario of a Business Entity Website,” *Intern. J. Res. Appl. Sci. Eng. Technol.* , vol. 5, no. 6, pp. 3076–3086, [Online]. Available: www.ijraset.com/3076
- [18] R. Firmansyah, 2019, “IMPLEMENTASI KEAMANAN PESAN TEKS MENGGUNAKAN KRIPTOGRAFI ALGORITMA RSA DENGAN METODE WATERFALL BERBASIS JAVA,” *Joutica*, vol. 4, no. 1, p. 174, doi: 10.30736/jti.v4i1.265.
- [19] R. A. Purba, 2021, “Application design to help predict market demand using the waterfall method,” *Matrix J. Manaj. Teknol. dan Inform.*, vol. 11, no. 3, pp. 140–149, doi: 10.31940/matrix.v11i3.140-149.