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Based Marketing Information System

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Abstrak-CV. RC Electronic currently has a promotion, sales, and marketing system for CCTV, IoT, and Alarm products that is not optimal because it still uses social media so that it is very dependent on the number of followers and it is feared that it will lose out on competition with other sellers and service providers. The company also does not have a digital online platform that focuses on increasing product promotion and sales so that the business products and services offered are not widely known even nationally.

In this research, an SEO (Search Engine Optimization) Based Marketing Information System is developed with the features of managing products, managing profiles and history, managing events, managing articles, managing news, and managing company contacts to increase the ranking of a website on search engine pages.

During system development, the company RC. Electronic provides a timeline in the form of project meetings, system blueprints, and system realization. The method used by our group in developing this system is the scrum methodology which is one of the frameworks of the agile software development methodology that can help solve a problem that is changing and complex, but can produce better, productive, and creative products.

This research introduces the development of an "SEO-based Marketing Information System", aiming to overcome the limitations of promotion and sales that have been dependent on social media and the number of visitors.

Keyword: *SEO, Marketing, Information, System, Scrum Methodology*

1. INTRODUCTION

In the era of globalization, information technology has developed rapidly, making it easier for us to obtain information without knowing the limitations of time and place. Information technology is now an inseparable part of our lives. Governments, organizations, political parties, foundations, institutions, and individuals use the internet to facilitate the provision of services and information, as well as to expand and develop their business services[1]. In the midst of this development, the company CV. RC Electronic faces challenges in the system of promotion, sales, and marketing of CCTV, IoT, and Alarm products. Currently, companies still rely on social media such as *Instagram*, *Facebook*and *WhatsApp*. This reliance on social media makes companies highly dependent on the number of *followers* of *Instagram*, *Facebook*, and the number *WhatsApp* that are stored. This raises concerns that the company could lose out on competition with other sellers or service providers who may have more sophisticated marketing strategies and a wider reach. In addition, CV. RC Electronic does not yet have a digital platform *online* which focuses on increasing the promotion and sales of CCTV, IoT, and Alarm products. As a result, the products and services offered have not been widely known, even nationally. This condition has a direct impact on the number of orders and the company's turnover which has not reached its maximum potential. Seeing these problems, our group concluded that it is necessary to create an SEO-based marketing information system *(Search Engine Optimization)*. SEO is a set of techniques and practices used to improve a website's ranking on search engine results pages. The main goal of SEO is to improve the visibility and ranking of a website on search engines like Google, making it easier for potential customers looking for relevant products or services.

By implementing SEO, CV. RC Electronic was able to optimize their website to make it easier for search engines to find. SEO works by using keywords or phrases that are relevant to the products and services offered. These keywords are then indexed by search engines, so that when a user searches for related information, the company's website can appear on the first page of search results[2]. SEO is a search technique that uses keywords or phrases that contain indicators contained in a web page. The information is then indexed by search engines, so that relevant websites can appear in search results. In addition, promotion enhancement also includes various strategies to expand reach by increasing the value of the product. This strategy includes the publication of

interesting and informative content and activities on social media that can reach a wider audience. By combining SEO and the right promotional strategies, companies can increase the visibility and appeal of their products. In its implementation, there are several steps that can be taken to optimize SEO on a CV website. RC Electronic. First, conduct keyword research to find the most relevant and searched keywords by users. These keywords should be related to the CCTV, IoT, and Alarm products offered by the company. After finding the right keywords, the next step is to integrate them into the website's content, including in the title, description, and body of the page. In addition, quality and relevant content is also very important for SEO. Content that is informative, engaging, and useful to users can increase visit time on a website, reducing the rate of *bounce rate*, and improve rankings in search engines. This content can be blog articles, product usage guides, video tutorials, and customer testimonials.

Not only that, but backlink strategy is also important in SEO. *A backlink* is a link from another website that leads to a company's website. Search engines consider backlinks as an indicator of a website's trust and authority. The more quality *backlinks* a website has, the higher it will rank in search engines. Therefore, building a network with other websites and getting quality *backlinks* can be part of an effective SEO strategy. Furthermore, technical optimization also needs to be considered. This includes website speed, search engine-friendly URL structure, and design that is responsive to various devices. Fast website speed and responsive display can improve the user experience, which in turn can have a positive impact on SEO rankings. In addition to optimizing SEO, CV. RC Electronic also needs to take advantage of other promotional strategies. For example, running paid advertising campaigns on search engines (SEM) and social media to reach a wider audience in less time. This advertising campaign can be adjusted to a specific target market, making it more effective in attracting relevant potential customers. Activities on social media can also be increased by taking advantage of the latest features such as stories, live streaming, and collaboration with *influencers*. By creating engaging content and interacting directly with the audience, companies can build closer relationships with customers and increase *brand awareness*. The implementation of an SEO-based marketing information system and a comprehensive promotion strategy is expected to help CVs. RC Electronic increases its visibility and competitiveness in the market. Thus, the company can attract more customers, increase the number of orders, and ultimately, increase turnover. Globalization and the development of information technology do bring challenges, but with the right strategy, CV. RC Electronic can use it to achieve greater success in the future.

2. RESEARCH METHODS

A research method is a set of steps that are systematically and logically arranged to achieve research objectives [3]. In the development of an SEO-based marketing system for CVs. RC Electronic, the research method used is Scrum. Scrum is a development method that is fast and responsive to changes that arise during the system development process [4]. The Scrum method was chosen because of its flexibility in adapting the design and implementation according to dynamic needs and desired targets. The Scrum method consists of several main stages, namely *Sprint Planning*, *Sprint*, *Sprint Review*, *dan Sprint Retrospective*. In addition, there are two important components in the Scrum method, namely *product backlog* and *sprint backlog*. *Product backlog* is a list of tasks that must be completed during the project. This task is dynamic and can change after each *Sprint* finish. *Sprint backlog*, on the other hand, is a list of tasks that the development team chooses to complete over the course of a single *Sprint* [5].

Implementation in the development of an SEO-based marketing system for CVs. RC Electronic, the implementation of the Scrum method will involve several key steps. First, the development team will work with *stakeholders* to compile a *product backlog* that includes all the features and functions needed for an SEO-based marketing system. Items in the *product backlog* can include keyword research, content creation, web page optimization, and *backlink* strategy. Next, in the *sprint planning stage*, the team will select items from the *product backlog* to be included in the *sprint backlog*. Each *sprint* will have a clear goal, such as improving the ranking of certain keywords or improving the speed of the website. Teams will work collaboratively during the sprint to complete tasks in the *backlog sprint*. Every day, the team will hold *a daily stand-up meeting* to discuss progress and overcome obstacles. At the end of the *sprint*, the team will present their work in *a sprint review* and receive feedback from *stakeholders*. This *feedback* will be used to update *the product backlog* and plan for *the next* sprint.

A retrospective will be held after each *sprint review* to evaluate the work process and find ways to improve the effectiveness of the team. Through *iterative cycles of planning, execution, review, and reflection*, the Scrum method allows the development team to continuously improve the SEO-based marketing system and adapt to changing market needs and conditions. Using the Scrum method, CV. RC Electronic was able to develop an SEO-based marketing system that was responsive to change, ensuring that each iteration of development brought the system closer to the desired target. Through this approach, companies can increase their *online* visibility, attract more potential customers, and ultimately increase the sales turnover of CCTV, IoT, and Alarm products.

3. RESULTS AND DISCUSSION

In today's digital era, an online presence is crucial for business success. More and more companies are turning to digital marketing to reach a wider audience and increase sales. One of the main components in a digital marketing strategy is search engine optimization (SEO). SEO is the practice of optimizing websites to rank higher in search engine results *(Search Engine Results Pages* / SERPs), which in turn can increase website visibility, traffic, and conversions. SEO is not just about using the right keywords, but it also involves a variety of technical elements and content that must be optimized for a website to meet search engine criteria. Search engines like Google use complex algorithms to rank websites based on the relevance and quality of content, site speed, user experience, and many other factors. Therefore, having a deep understanding of SEO and how to implement it effectively is essential to achieve business goals.

This report presents the design of an SEO-based marketing information system to help companies improve the visibility and ranking of their websites in search engines. By implementing the right SEO practices, companies can not only increase brand exposure and sales, but also adapt to changing consumer behavior and digital market trends more responsively. The design of this Information System is designed to optimize the company's website in order to achieve higher rankings in search engine search results *(Search Engine Results Pages*/SERPs*)* by implementing appropriate SEO practices [6]. Thus, designing an SEO-based marketing information system not only helps to increase brand exposure and sales, but also allows companies to adapt to changes in consumer behavior and digital market trends more responsively. The system built is expected to meet the needs of the system, including:

3.1 Search Engine Optimizer *Design*

SEO Design *(Search Engine Optimization)* is a crucial component in optimizing a website's visibility in search engine results. In the context of this research, several key elements of SEO design have been implemented to improve the ranking and visibility of the Company's website [7]. The following are some of the important aspects implemented:

3.1.1 HTML Elements

The right HTML elements greatly affect how search engines index and display a website. The following elements are very important in SEO design:

Table 1. Elmen HTML

***Tag Title*:**	***Meta Description*:**
1. *The title tag* should accurately reflect the content of the page and contain relevant keywords. **2. The optimal length of the *title tag* is 50-60 characters to ensure that the entire title is visible in the search results.** **3. Catchy and informative title tags can increase the click-through rate (CTR) of search results.**	1. *The meta description* should provide a clear and compelling summary of the page's content. 2. The optimal length is about 160 characters to ensure the meta description appears in full in search results. 4. *A good meta description* can increase CTR by grabbing users' attention and giving a clear picture of the content of the page.
***Alt Text* for Images:**	*Hyperlink*:
1. Every image on a website should have descriptive *alt text* to help search engines understand the content of the image. **2. *Alt text* also helps accessibility for users with visual impairments.** **3. The proper use of *alt text* can help in image search rankings in search engines.**	1. The use of *the "nofollow"* attribute for paid or untrusted links ensures that search engines do not follow those links. 2. The anchor text should be relevant and describe the content of the intended page. 3. Good internal *linking* can help search engines in indexing the pages within a website.

3.1.2 *Sitemap* & *Social* Metadata

Table 2. *Sitemap* & *Metadata*

Sitemap	***Social Meta Data***
1. *Sitemaps* in XML format help search engines index all the pages of a website efficiently. **2. The sitemap should be updated regularly to reflect changes to the website.**	1. Social metadata, such as *Open Graph*, increases the visibility of content on social media platforms. 2. The use of *Open Graph* can help in displaying richer information when pages are shared on social media.
<url> **<place>https://cctvpintar.id/</seat>** **<lastmod>2024-05-29T18:18:34+00:00</lastmod>** **<priority>1.00</priority>** **</url>**	<meta property="og:locale" content="id"> <meta property="og:title" content="Solusi CCTV, IoT, Smart Home | CCTV Pintar"> <meta property="og:type" content="website"> <meta property="og:url" content="https://cctvpintar.id/Home"> <meta property="og:description" content=" Find the best security solutions for your home and business with CCTV, GPS tracker, and Smart Home products. View a wide range of high-quality products to monitor, track, and control security from anywhere. ">

3.2 UML *Modeling*

In designing the system to be built, the researcher uses *Unified Modelling Language* (UML), which is the language used to define the needs and describe the design and architecture of the system created [8]. The UML used consists of *use case diagram*, *activity diagram*, *sequence diagram*and *class diagram*. Here is an explanation of each diagram:

3.2.1.1 Usecase Diagram

Usecase diagram is a modeling that describes the interaction between *user* or system user with the system to be built [9]. *Usecase* This system can be described as follows:

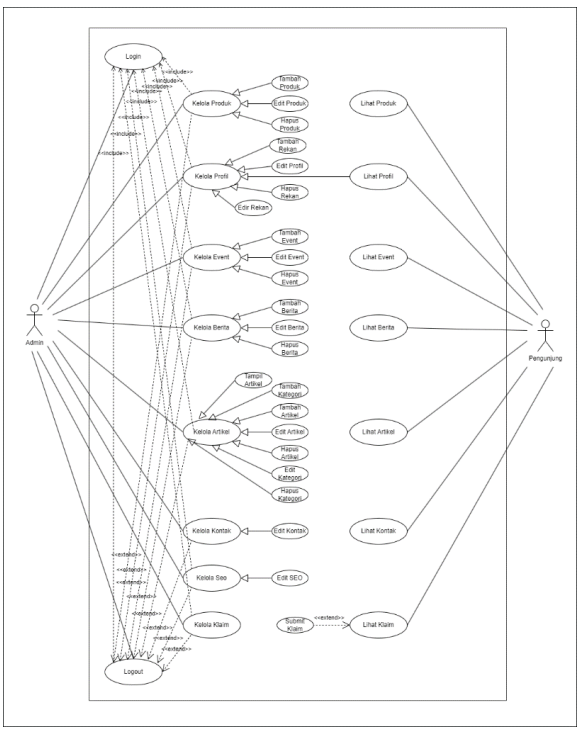

Figure 1. *Usecase Diagram*

This diagram shows the actors (users) and *use cases* (functions or services) that exist in the system. The main actors are usually administrators, general users, and search engines. *Use cases* include functions such as managing articles, viewing articles, managing SEO, and others.

3.2.2 Activity Diagram

Activity diagram is a diagram that depicts the various streams of activity in the system being designed, how each stream begins, *decision* that might happen, and how they end. *Activity* Diagrams can also illustrate parallel processes that may occur on multiple executions [10].

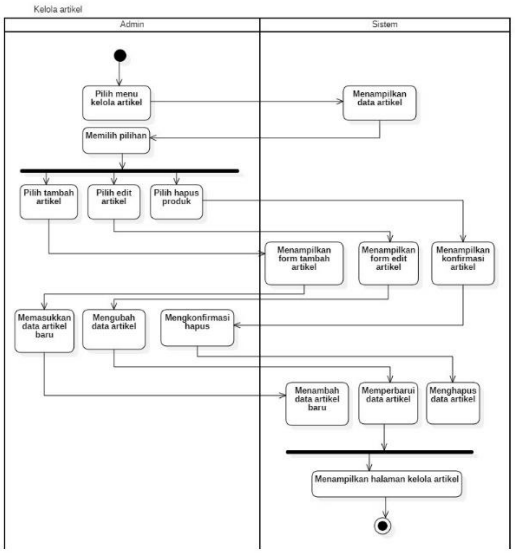

Figure 2. *Activity Diagram* Manage Articles

This diagram illustrates the steps taken to manage articles in the system. Starting from writing articles, saving articles, to publishing articles.

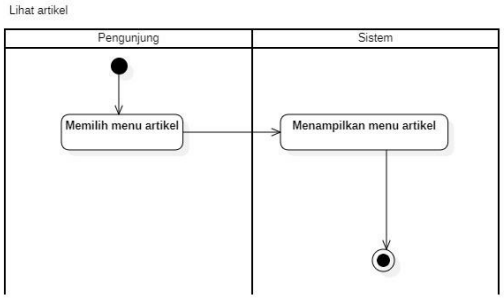

Figure 3. *Activity Diagram* View Article

This diagram shows the process that occurs when a user views an article. Starting from choosing an article to reading the content of the article.

3.2.3 Sequence Diagram

Sequence diagram is a diagram that depicts the interaction between objects. *Sequence* The diagram specifically describes *behavior* a single scenario. The diagram shows a number of example objects and messages that pass through these objects in a *use case* [11].

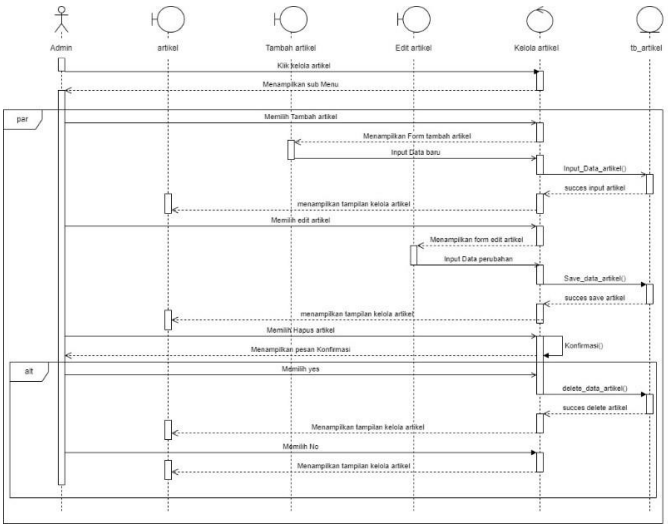

Figure 4. *Sequence Diagram* Manage Articles

This diagram shows the interaction between the admin and the system in the article management process. Starting from entering the content of the article to saving the changes.

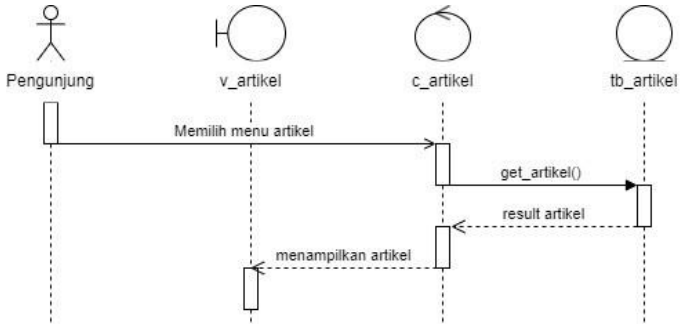

Figure 5. *Sequence Diagram* See Article

This diagram illustrates how users interact with the system when viewing articles. Starting from selecting articles from the list to reading the content.

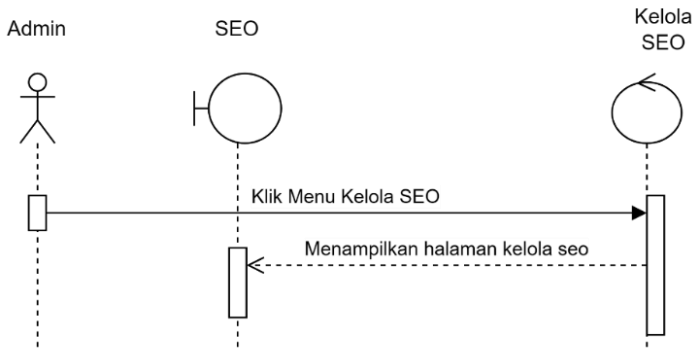

Figure 6. *Sequence Diagram* Manage SEO

This diagram shows the steps taken by the admin to manage the elements of SEO.
Included in this process is the optimization of *title tags, meta descriptions*, and others.

3.2.4 Class Diagram

Class diagram is an illustration between *class* that are modeled within the system. *Class* describe *class* which includes attributes, behaviors, and *states* [12]. Here's a depiction of *class* diagram on this system.

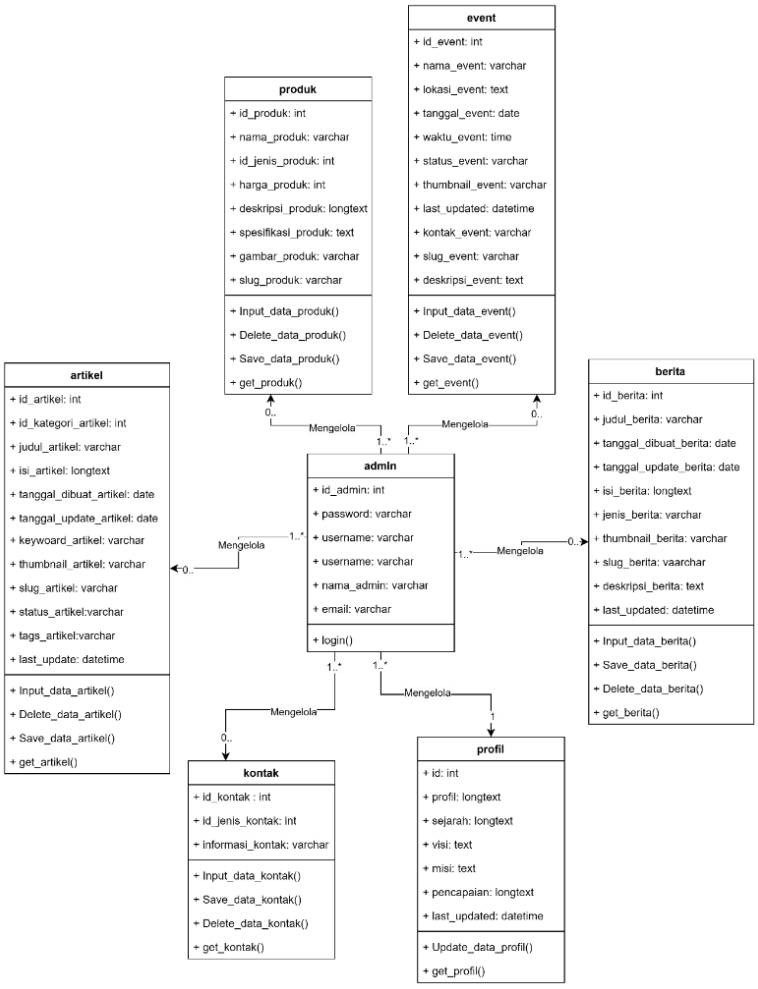

Figure 7. *Class Diagram*

This diagram shows the different classes in the system and the relationships between them. Included in this diagram are classes for users, articles, SEO, and others.

3.2.5 ERD

Entity Relationship Diagram (ERD) is a component component of the entity and the set of relationships that are each equipped with attributes that present all the facts of the intended real world [13]. The ERD of this system has 7 interrelated entities but does not have an entity that makes transactions. The ERD of this system has 7 interrelated entities but does not have an entity that makes transactions.

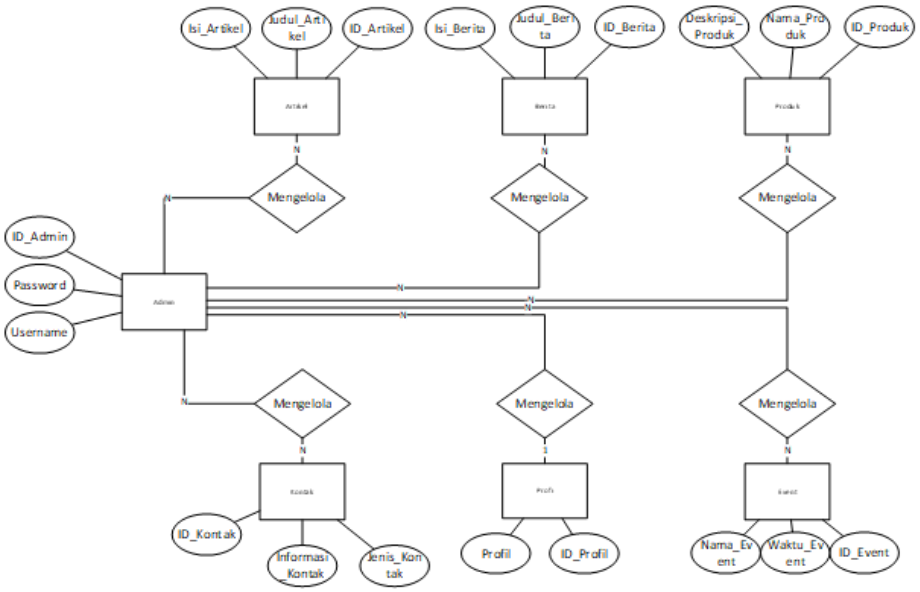

Figure 8. ERD

This diagram depicts entities such as users, articles, comments, and relationships between those entities. Each entity has attributes that describe the characteristics of each entity.

3.2.6 User Interface

User Interface is a way used to interact between humans and systems. Sometimes, UI is referred to as a substitute *Human-Computer Interaction* (HCI) which includes all interactions made by humans with computers [14].

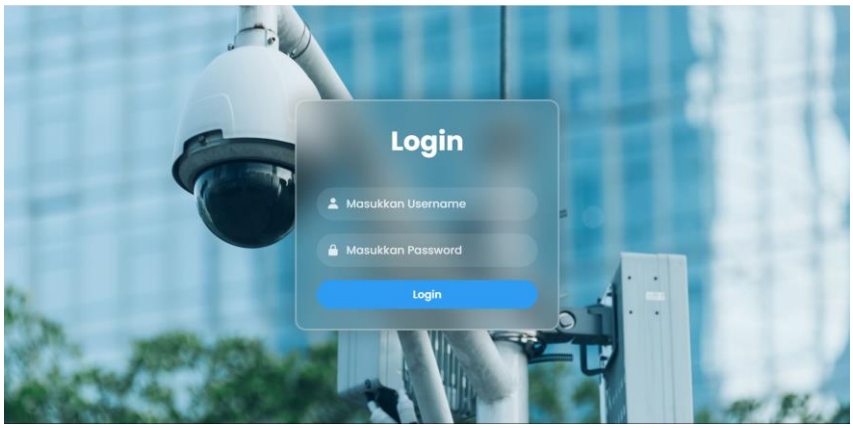

Figure 9. Admin Login View

This view is the interface where admins enter login credentials to access the system.
Key elements include input boxes for usernames and passwords as well as login buttons.

Figure 10. Homepage Display

It is the main view of the customer, and also the customer does not need to be logged in to be able to access this page.

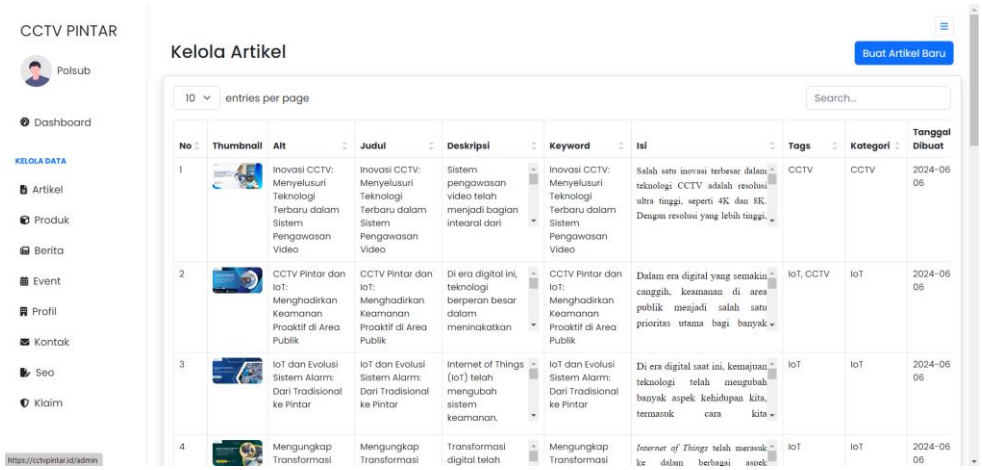

Figure 11. Manage Article View

This view allows admins to add, edit, and delete articles. Key elements include an input form for article titles, content, SEO *tags*, and a button to save changes.

3.3 SEO Implementation

The implementation of SEO in this marketing information system is carried out through various techniques and strategies designed to increase the visibility of the company's website in search engine results. Here are the steps to implement SEO:

3.3.1 Content Optimization

1. Keyword Research:
   - Identify keywords that are relevant to the business and have a high search volume.
   - Use a tool like *Google Keyword Planner* to determine the right keywords.
2. Quality Content Writing:
   - Create content that is informative, engaging, and in accordance with the targeted keywords.
   - Optimize the use of keywords in the title, subheading, and first paragraph of the article.
3. Usage *of Heading Tags* (H1, H2, H3):
   - Structuring the structure of the article using *appropriate heading tags* to make it easier for search engines to understand the content.
   - *H1 tags* are used for the main heading, while H2 and H3 are used for subheadings and other important points.

3.3.2 Optimization *On-Page*

1. *Tag Title dan Meta Description*:
   - Write *title tags* that are attractive and relevant to the keyword, and adhere to the optimal length (50-60 characters).
   - Compose an informative and attention-grabbing meta description, with an optimal length of about 160 characters.
2. Use *of Alt Text* on Images:
   - Add descriptive *alt text* to each image to help search engines understand the content of the image and improve accessibility.
3. Internal *Linking*:
   - Linking relevant pages within a website to help search engines index those pages and improve user navigation.

3.3.3 Optimization *Off-Page*

1. *Backlink Building*:
   - Building backlinks from quality and relevant websites to increase domain authority.
   - Using techniques such as guest posting, creating shareable content, and participating in industry forums.
2. Social Media:
   - Use social media platforms to share content and increase user visibility and engagement.
   - Optimize social metadata (*Open Graph*) to ensure a compelling display of content when shared on social media.

3.3.4 Technical SEO

1. *Sitemap* XML:
   - Create and submit an XML sitemap to search engines to ensure all pages are indexed correctly.
   - Update the *sitemap* periodically to reflect changes to the website.

2. *Robots.txt*:
   - Using robots.txt files to direct search engines on pages that can and cannot be indexed.

3. Site Speed:
   - Optimize website speed by reducing image size, using *caching*, and optimizing code.

3.3.5 Monitoring and Analysis

1. *Google Analytics*:
   - Use *Google Analytics* to monitor website traffic, identify the most visited pages, and analyze user behavior.

2. *Google Search Console*:

- Monitor your website's performance in search results, identify indexing issues, and receive suggestions from Google to improve SEO.

3. Periodic SEO Audits:
   - Conduct regular SEO audits to identify and fix technical issues, as well as ensure SEO strategies remain effective.

This comprehensive SEO implementation is expected to improve the ranking of a company's website on search engines, increase the number of visitors, and ultimately increase conversions as well as sales.

A. SEO Tools

3.4.1 SEMrush

SEMrush is one of the most popular SEO tools and is used by many professionals around the world. The tool provides a variety of features designed to assist users in keyword research, competitive analysis, website audits, rank tracking, and more. Here are some of the key features of SEMrush and how they can be used to improve SEO strategies:

3.4.1.1 Keyword Research:

SEMrush allows users to find keywords that are relevant to their business and analyze search volume, keyword difficulty levels, as well as potential traffic. With this feature, users can identify the most effective keywords to target in their content.

3.4.1.2 Competitive Analysis:

With SEMrush, users can analyze their competitors' websites to see the keywords they are ranking for, the ads they are running, and the backlinks they have. This information can be used to develop better strategies to beat competitors in search results.

3.4.1.3 Website Audit:

SEMrush provides a website audit tool that helps users identify technical issues that could affect their SEO rankings. The tool checks for elements such as site speed, security, and errors in the HTML, as well as provides suggestions for improvement.

3.4.1.4 Rank Tracking:

SEMrush's rank tracking feature allows users to monitor their website's position in search results for selected keywords. Users can see changes in rankings over time and evaluate the effectiveness of their SEO strategies.

3.4.1.5 *Backlink Analysis*:

SEMrush provides an in-depth analysis of a website's *backlink* profile . Users can see where their *backlinks* are coming from, the quality of those links, and how they affect their website's domain authority. With this information, users can build a more effective backlink strategy.

3.4.1.6 *Content Marketing Toolkit*:

SEMrush also offers tools for content marketing, including content analysis, suggestions for trending topics, and guides for creating better content. This tool assists users in creating engaging and relevant content that can improve SEO rankings.

3.4.2 Advantages of SEMrush

By using SEMrush, companies can optimize their websites more effectively, increase visibility on search engines, and ultimately achieve their digital marketing goals. The implementation of a tool like SEMrush is an important step in a comprehensive and sustainable SEO strategy.

4. CONCLUSION

This research has successfully developed an SEO-based Marketing Information System (Search Engine Optimization) to improve the visibility and ranking of CV websites. RC Electronic in search engine results. By utilizing SEO, this system aims to overcome the company's dependence on social media such as *Instagram*, *Facebook*, and *WhatsApp* in the promotion and sale of CCTV, IoT, and Alarm products. The developed information system includes various features for managing products, profiles, history, events, articles, news, and company contacts. These features are also designed to make it easier for admins to create and manage content, provide interesting information for visitors, and increase organic traffic for visitors who come through search engines such as Google and Bing. The implementation of SEO in this system is expected to increase brand exposure and reach a wider audience effectively.

This Scrum methodology was chosen and used in the development of this system because of its ability to respond to changes quickly and efficiently. Scrum involves the stages of *Sprint Planning, Sprint, Sprint Review,* and *Retrospective of the Sprint*. In this method, two important factors are *the product backlog* and *the sprint backlog*. *A product backlog* is a collection of tasks that must be completed during a project, while *a sprint backlog* is a task that the development team chooses to work on in each *sprint*. The functional and non-functional needs of the system have also been identified and described in detail. Functional needs include the facilities needed by the system to increase visitor traffic, make it easier for admins to create content, and provide interesting information to visitors. The actors involved in the use of the system are admins and visitors, with each having different roles and activities within the system.

Non-functional needs include aspects such as availability, portability, ergonomics, security, and communication language. The system is designed to be available online 24 hours a day, runs on various platforms without the need for modification, provides comfort and ease of navigation for users, and is protected by security features such as login and authorization. The system also uses Indonesian and English to ensure wider accessibility. *Unified Modelling Language* (UML) is used in designing this system, including *use case diagrams, activity diagrams, sequence diagrams,* and *class* diagrams. These diagrams provide a clear picture of the interaction between the user and the system, the flow of activity in the system, and the structure and relationships between classes in the system.

THANK-YOU NOTE

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The support and assistance from all parties has enabled this research to be carried out well and we hope that the results of this research can make a positive contribution to the development of science and technology, as well as be beneficial to all interested parties.

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