Performance Analysis of PT. Bina Wahyu Ramadhany's Website Using GTmetrix

Diana Rosilawati[1], Leon Andretti Abdillah[2]
[1,2]Science and Technology, Information Systems
Universitas Bina Darma
Palembang, Indonesia
e-mail: [1]dianarosilawati5@gmail.com

Revised: March,09, 2025; Accepted: May, 02,2025

Abstract

PT. Bina Wahyu Ramadhany is a company specializing in Occupational Safety and Health (K3) services. This study aims to evaluate the effectiveness and efficiency of the company's website as an information source for users. The analysis ensures that the website is accessible, delivers accurate and up-to-date information, and provides an optimal user experience. Website performance testing is conducted using GTmetrix, a tool that assesses website speed and efficiency while offering recommendations for potential improvements. Additionally, Speedtest.net is utilized to measure the stability and speed of internet access on the testing devices. The results from GTmetrix analysis indicate that the PT. Bina Wahyu Ramadhany website achieved an overall Grade A score with a 99% performance rating, marked by a green indicator. This rating signifies that the website's performance is classified as excellent. Based on these findings, it can be concluded that a higher performance score correlates with better website accessibility and an enhanced user experience.

Keywords: *web GTmetrix, internet speed stability, load time analysis, web performance testing, website efficiency, website performance.*

1. INTRODUCTION

A website serves as a vital platform for disseminating information to a broad audience efficiently and effectively [1]. In today's digital era, the accessibility and performance of a website play a crucial role in ensuring a seamless user experience. A well-performing website enhances user satisfaction, benefiting both the general public and the academic community in obtaining relevant and accurate information [2]. However, despite the increasing reliance on websites for information retrieval, many websites still face performance-related challenges, such as slow loading times, poor responsiveness, and ineffective content delivery. These issues can negatively impact user engagement and the overall credibility of an institution or company.

The performance of a website is typically assessed based on several key factors, including loading speed, responsiveness across different devices and browsers, content readability, and design consistency. When these factors are not optimized, users may experience delays in accessing information, leading to frustration and decreased user retention. Studies have shown that users tend to abandon websites that take too long to load, which can result in high bounce rates and reduced visibility in search engine rankings [3]. Additionally, websites that are not optimized for different devices may fail to deliver a consistent experience, further affecting usability. If such performance issues persist, they can damage an organization's reputation and diminish the effectiveness of its digital presence.

Several previous studies have analyzed website performance using GTmetrix, a widely recognized tool for evaluating website speed and efficiency. Research has been conducted on various platforms, including the AKN Blitar website, PT. Telkom's website, higher education institution websites, and government websites. These studies highlight the importance of performance evaluation in maintaining an optimal user experience and ensuring that websites function efficiently [3]. Despite these advancements, many websites, particularly those belonging to smaller companies, often lack regular performance assessments, which can lead to unnoticed technical inefficiencies and a decline in overall effectiveness.

PT. Bina Wahyu Ramadhany is a company specializing in Occupational Health and Safety (OHS) services. The company relies on its website, accessible at https://sites.google.com/view/binawahyuramadhany/home, as a primary medium for disseminating

information about its K3 training services, which are certified by KEMNAKER RI. As a crucial source of information for clients and stakeholders, the website must perform optimally to ensure seamless access to its services. However, to date, there has been no comprehensive evaluation of its performance. Without proper testing, potential issues such as slow loading times, inefficient content delivery, and poor accessibility may remain undetected, potentially hindering user engagement and reducing the company's credibility. If users face difficulties accessing the website, they may seek alternative service providers, leading to lost business opportunities.

This study aims to address these concerns by evaluating the performance of the PT. Bina Wahyu Ramadhany website using GTmetrix. The primary objectives are to assess the website's loading speed, identify performance bottlenecks, and determine whether it meets modern usability and accessibility standards. Additionally, Speedtest.net will be used to measure the stability and speed of internet access on the devices used for testing. The results of this study are expected to provide valuable insights into the current state of the website and offer recommendations for necessary improvements. These improvements may include optimizing loading speed, enhancing mobile responsiveness, implementing caching mechanisms, and improving overall user experience. By addressing these issues, PT. Bina Wahyu Ramadhany can ensure that its website remains an effective and reliable digital platform for delivering critical information about its services.

Ultimately, this research underscores the importance of regular website performance evaluations to maintain a competitive online presence. By implementing the recommended optimizations, PT. Bina Wahyu Ramadhany can enhance user satisfaction, strengthen its professional reputation, and ensure that its digital platform effectively supports its business objectives.

2. RESEARCH METHOD

GTmetrix is a widely used tool for measuring website speed and performance, providing a comprehensive analysis of how well a website functions [4]. Developed by GT.net, this tool helps users identify performance bottlenecks and offers optimization recommendations to improve website efficiency. After conducting a performance test, GTmetrix generates a detailed evaluation report, including performance scores and specific suggestions for improvement. The assessment system in GTmetrix uses a grading scale from A to F, where Grade A represents excellent website performance, while Grade F indicates poor performance, requiring significant optimization efforts [5]. GTmetrix evaluates website performance based on a percentage-based color grading system, as shown in Table 1.

Table 1. Performance Score and Color Criteria [4]

Color	Performance Score (%)
Green	91% - 100%
Light Green	76% - 90%
Orange	51% - 75%
Red	0% - 50%

Based on the analysis results, GTmetrix categorizes website performance scores into several levels, ranging from the best (Grade A) to the lowest (Grade F). Websites with outstanding performance receive Grade A, indicating optimal speed and responsiveness, while websites with poor performance may receive lower grades, such as D, E, or even F, signaling the need for substantial improvements [4]. In this research, the performance of the PT. Bina Wahyu Ramadhany website is evaluated by conducting tests using GTmetrix and analyzing the obtained results. The study follows a structured methodology consisting of several stages, including data collection, website testing, result interpretation, and optimization recommendations. Additionally, specific tools are employed to support the analysis process, ensuring accurate and reliable performance assessment. By utilizing GTmetrix, this research aims to provide a comprehensive evaluation of the website's efficiency and offer insights into necessary enhancements to optimize user experience and accessibility.

.

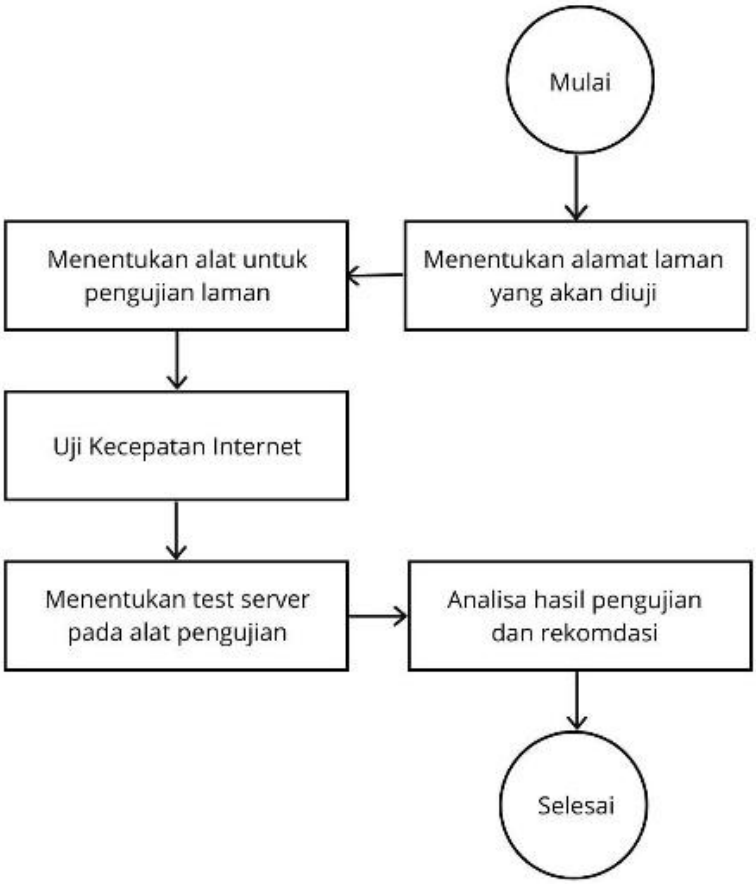

Figure 1. Research Flowchart [2]

The flowchart in Figure 1 outlines the systematic steps involved in evaluating website performance. The process begins with selecting the website to be tested, which in this study was conducted in February 2024. Once the website was identified, the next step was choosing the appropriate testing tool, with GTMetrix being selected as the primary tool for performance measurement. Before conducting the website performance test, an internet speed test was performed using Speedtest to ensure a stable network connection, preventing any potential bias in the results. Following this, the test server was determined, with the website being evaluated using a GTMetrix server located in Vancouver, Canada, and accessed via Google Chrome. Finally, after completing the performance test, the results were analyzed, and recommendations for website optimization were formulated based on the findings. This structured approach ensures a comprehensive assessment of the website's efficiency and provides valuable insights for potential improvements.

The selection of the GTmetrix server in Vancouver was made because this server provides more consistent testing parameters and is more commonly used in global website performance analysis. By using the Vancouver server, test results can be compared with various other studies that utilize GTmetrix as a tool for analyzing website speed and performance. Additionally, this selection also considers the availability of a stable server that supports testing with a neutral location.

In this study, the hardware used was a laptop with an AMD Ryzen 3 5300U processor with Radeon Graphics 2.60 GHz, 8GB RAM, and the Windows 11 operating system. The software used included the latest version of the Google Chrome browser to run GTmetrix tests. By including these specifications, the study can be replicated by other researchers to obtain more accurate and consistent results.

3. RESULTS AND DISCUSSION

ensure optimal testing conditions, an internet connection speed test was conducted before accessing GTMetrix. This step was crucial to verify that network performance would not impact the accuracy of website performance evaluations..

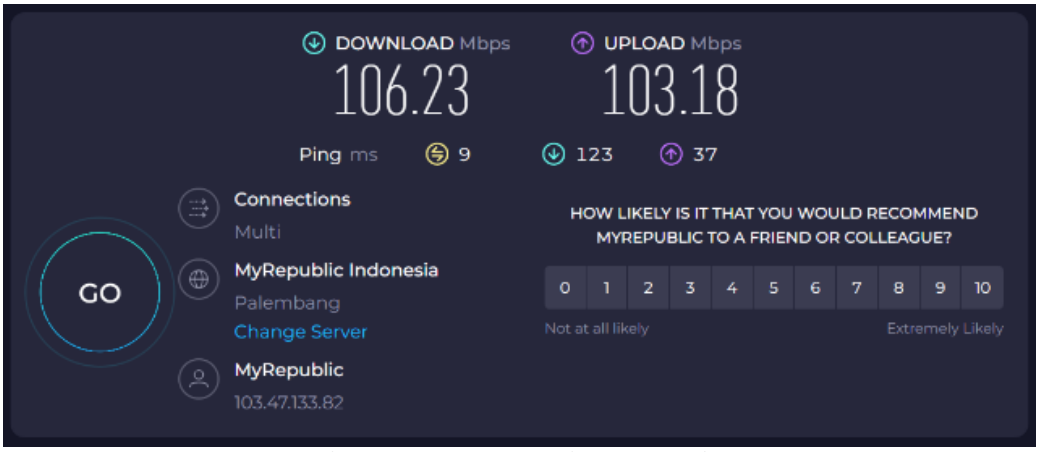

Figure 2. Internet Connection Test Results

Figure 2 displays the results of the internet speed test conducted using *Speedtest*. The test recorded a download speed of 106.23 Mbps, an upload speed of 103.18 Mbps, and a ping of 9 ms. A high-speed internet connection ensures faster website access, smooth streaming experiences, and efficient file uploads and downloads. The low latency further minimizes delays in real-time interactions.

3.1. System Performance Testing

Evaluating a website's performance is essential to ensuring fast loading times and an optimal user experience. GTMetrix was used to analyze key performance metrics, including Performance Score, Structure Score, and Web Vitals. Figure 3 presents the GTMetrix performance report for the PT. Bina Wahyu Ramadhany website, detailing an overall assessment, performance ratings, and critical web vitals such as Largest Contentful Paint (LCP), Total Blocking Time (TBT), and Cumulative Layout Shift (CLS).

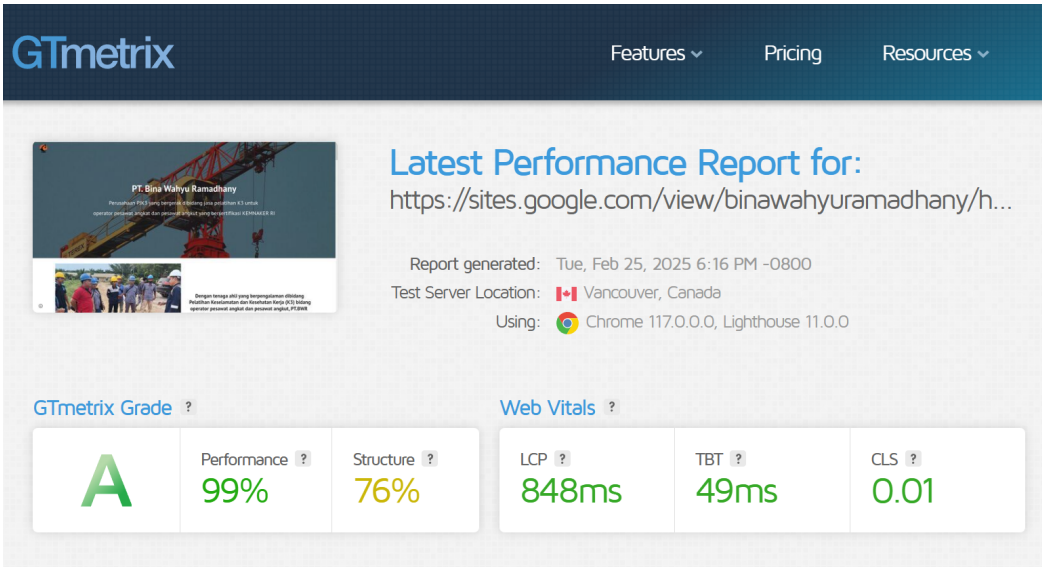

Figure 3. Website Performance Test Results

Based on the analysis, the website achieved a Performance Score of 99%, which indicates excellent responsiveness and efficiency. The Structure Score was 76%, suggesting that there is still room for improvement in website structure and code optimization. The Web Vitals analysis revealed that the LCP was 848 ms, demonstrating a fast rendering process, while the TBT was recorded at 49 ms, indicating minimal delays in content execution. Furthermore, the CLS value of 0.01 suggests that the website has a stable layout, with almost no unexpected shifts in visual elements.

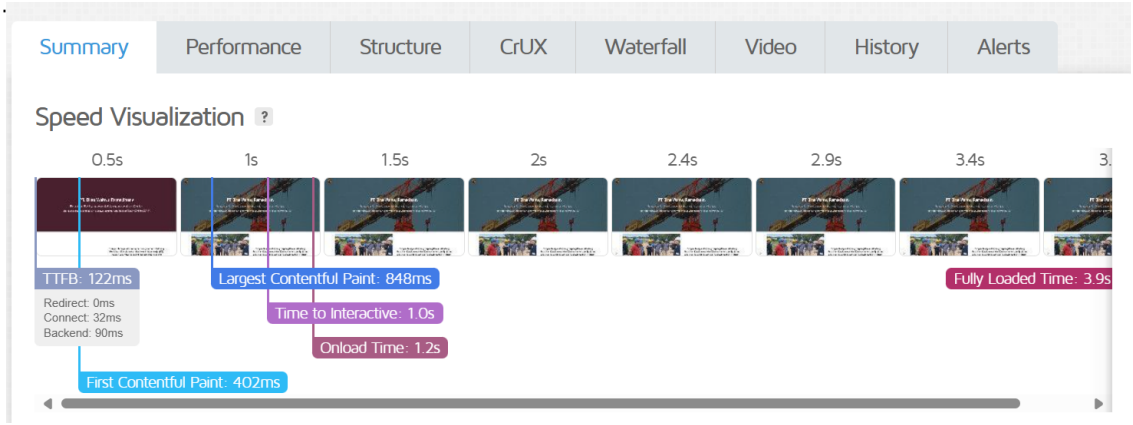

Figure 4. Speed Visualization Results

A detailed speed visualization analysis was conducted to further examine the website's loading behavior, as illustrated in Figure 4. The Total Blocking Time (TBT) was 122 ms, which encompasses redirect time, connection establishment, and backend processing. Several key speed indicators were measured, including the First Contentful Paint (FCP), which occurred at 420 ms, representing the time when the first visual element appeared on the screen. The Largest Contentful Paint (LCP) was 848 ms, confirming the efficient loading of the largest visible content. Additionally, the Time to Interactive (TTI) was recorded at 1.0 second, indicating that the webpage became fully functional in a very short duration. The Fully Loaded Time reached 3.9 seconds, meaning that all website components, including images, scripts, and additional assets, were completely loaded within this timeframe. These results highlight the website's strong performance, ensuring a smooth and responsive user experience.

Figure 5. Fully Loaded Time, Total Page Size, and Total Page Requests

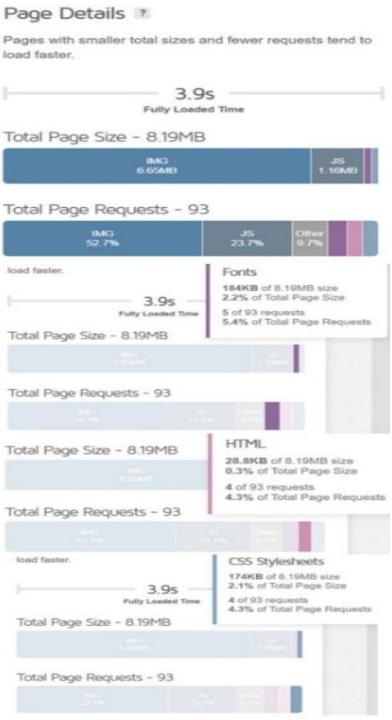

Figure 5 illustrates the number of requests made to the loading. The total page size was portion attributed to image files requests), followed by JavaScript other components such as fonts, number of requests made was 93, from images and JavaScript. These image files significantly impact performance, image optimization compression and lazy loading could minimizing the number of HTTP redundant JavaScript and CSS files.

total page size and the server during website 8.19 MB, with the largest (6.65 MB or 52.7% of total files (1.16 MB or 23.7%), and HTML, and CSS. The total with the majority coming findings suggest that large page load time. To improve techniques such as be implemented, along with requests by reducing

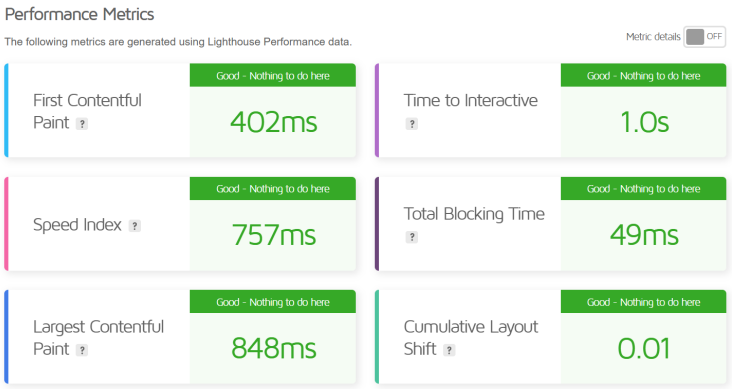

Figure 6. Performance Metrics

The website's performance metrics, presented in Figure 6, confirm its high responsiveness and efficient load times. The First Contentful Paint (FCP) was recorded at 402 ms, indicating a quick initial rendering. The Speed Index was measured at 757 ms, reflecting a smooth and visually fast loading experience. The Largest Contentful Paint (LCP) was 848 ms, confirming that the most significant content loaded quickly. The Time to Interactive (TTI) was 1.0 second, ensuring users could interact with the website in a short time. Additionally, the Total Blocking Time (TBT) was 49 ms, indicating minimal delays, while the Cumulative Layout Shift (CLS) was 0.01, confirming that the website maintained a stable layout without unexpected shifts. These results collectively demonstrate that the website delivers a highly optimized and seamless user experience, meeting performance benchmarks effectively.

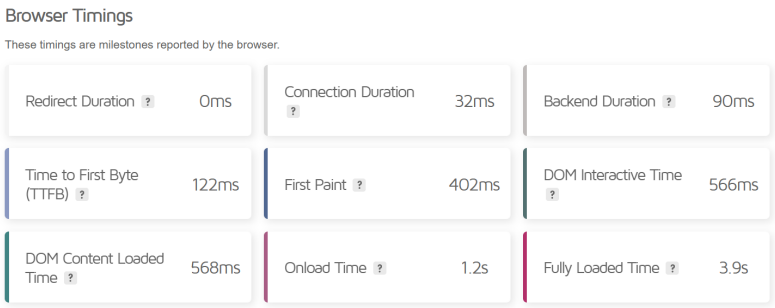

Figure 7. Browser Timings

Further analysis of browser timings, as shown in Figure 7, provides insights into the website's loading sequence. The Redirect Duration was 0 ms, indicating that there were no unnecessary redirections before accessing the page. The Time to First Byte (TTFB) was 122 ms, which measures the time taken for the server to send the first byte of data to the browser. The Connection Duration was 32 ms, reflecting the time required to establish a connection with the server, while the Backend Duration was recorded at 90 ms, representing the time needed for server-side processing. The First Paint occurred at 402 ms, marking the point when the first visual elements appeared. The DOM Interactive Time was 566 ms, indicating when the webpage became ready for interactions, while the DOM Content Loaded Time was 568 ms, confirming that all HTML content was fully loaded. The Onload Time was recorded at 1.2 seconds, signifying the moment when the entire page was fully displayed, and the Fully Loaded Time reached 3.9 seconds, ensuring that all website resources, including external scripts and stylesheets, had completed loading. These results demonstrate that the website benefits from an efficient and optimized loading process, allowing users to access content quickly with minimal latency.

The findings of this study indicate that the PT. Bina Wahyu Ramadhany website is highly optimized, achieving a Grade A score with a 99% performance rating. The website demonstrates fast loading speeds, with a Fully Loaded Time of 3.9 seconds and a Largest Contentful Paint (LCP) of 848 ms, ensuring a smooth and efficient user experience. Additionally, it offers optimized interactivity, with a Time to Interactive (TTI) of just 1.0 second, allowing users to engage with the website almost instantly. The layout stability is well-maintained, as reflected in the Cumulative Layout Shift (CLS) score of 0.01, ensuring minimal unexpected visual shifts. Despite these strengths, further optimization is recommended,

particularly in reducing image sizes and minimizing JavaScript requests, which could further enhance overall performance. With additional improvements in image compression and script optimization, the website has the potential to achieve even faster load times and better efficiency, providing an even more seamless browsing experience.

In addition to image and JavaScript optimization, several other aspects can be improved to enhance the performance of the PT. Bina Wahyu Ramadhany website. One key improvement is server-side optimization, including the use of more effective caching and the implementation of a Content Delivery Network (CDN) to speed up page load times. Additionally, reducing the number of HTTP requests by combining CSS and JavaScript files can improve loading efficiency.

Furthermore, optimization strategies can include minifying CSS and HTML code, as well as implementing lazy loading to reduce the initial load burden when accessing the page. By applying these techniques, the website can achieve better performance, enhance user experience, and improve its ranking in Google search results.

4. CONCLUSION AND RECOMMENDATIONS

The performance analysis of the PT. Bina Wahyu Ramadhany website confirms that it is highly optimized, achieving a Grade A score with a 99% performance rating. The website demonstrates fast loading times, with a Fully Loaded Time of 3.9 seconds and a Largest Contentful Paint (LCP) of 848 ms, ensuring a smooth and responsive user experience. Additionally, the Time to Interactive (TTI) of 1.0 second highlights its ability to quickly become functional, while the Cumulative Layout Shift (CLS) score of 0.01 ensures a stable and consistent visual layout. These metrics indicate that the website is well-structured and delivers efficient performance with minimal delays.

However, there are still opportunities for further optimization. Based on the research findings, the optimization of the PT. Bina Wahyu Ramadhany website can be categorized into three main strategies. First, image optimization, which includes image compression and selecting more efficient image formats. Second, code optimization, involving minification and the reduction of unnecessary JavaScript and CSS. Third, server optimization, such as the use of a Content Delivery Network (CDN), caching, and reducing HTTP requests.

By implementing these strategies simultaneously, the website's performance can improve significantly, resulting in faster load times and enhanced user satisfaction. These measures will also have a positive impact on Search Engine Optimization (SEO), making the website easier to find for potential customers.

REFERENCES

[1] M. Arafat, Y. Trimarsiah, and H. Susantho, "Rancang Bangun Sistem Informasi Pemesanan Online Percetakan Sriwijaya Multi Grafika Berbasis Website," *INTECH (Informatika dan Teknologi)*, vol. 3, no. 2, pp. 58–63, 2022.

[2] M. Mujiono and M. N. Fuad, "Pengujian Performa Laman AKN Blitar Menggunakan GTMetrix," *Journal of Electrical, Electronic, Mechanical, Informatic and Social Applied Science*, vol. 3, no. 1, pp. 16–21, 2024.

[3] A. Octaviani and R. Andraini, "SINTESIA: Jurnal Sistem dan Teknologi Informasi Indonesia ANALISIS WEBSITE FAKULTAS TEKNIK UNIVERSITAS NEGERI JAKARTA MENGGUNAKAN PINGDOM TOOLS DAN GTMETRIX", [Online]. Available: https://tools.pingdom.com/

[4] S. A. Arni, D. C. Mongkau, and A. Berelaku, "Analisis Performa Website Menggunakan GTMetrix:-," *Jurnal Minfo Polgan*, vol. 12, no. 1, pp. 857–861, 2023.

[5] C. Carkiman, "Pengujian Performa Dan Tingkat Stress Pada Website Resmi Perguruan Tinggi di Kabupaten Subang," *Jurnal Jawara Sistem Informasi*, vol. 1, no. 1, 2023.

[6] A. Widi, E. Sediyono, and H. Hendry, "Analisa Performa Website Organisasi Akuatik Menggunakan Automated Software Testing GTmetrix," *Jurnal Teknologi Sistem Informasi*, vol. 5, no. 2, pp. 25–33, 2024.

[7] M. F. Halim, M. R. N. Yasin, and S. Arni, "ANALISIS KINERJA WEBSITE PT. TELKOM AKSES MENGGUNAKAN GTMETRIX," *Jurnal Review Pendidikan dan Pengajaran (JRPP)*, vol. 7, no. 3, pp. 6909–6915, 2024.

[8] M. Hari, "Analisis Website Menggunakan GTMetrix Tools," *Journal of Technology and Data Science*, vol. 1, no. 2, 2024.

[9] R. N. Bija, A. P. Talaohu, and A. Munandar, "Analisis Kualitas Website Bursa Efek Indonesia Dengan Menggunakan Metode Gtmetrix," *Scientific Journal Of Reflection: Economic, Accounting, Management and Business*, vol. 7, no. 2, pp. 554–561, 2024.

[10] U. Darmawan, "Analisis Penerapan Website e-Government Pemerintah Kabupaten Tangerang Menggunakan GTMetrix," *Analisis Penerapan Website e-Government Pemerintah Kabupaten Tangerang Menggunakan GTMetrix*, 2022.