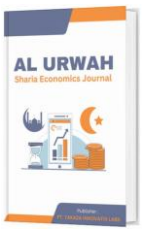
Al Urwah: Sharia Economics Journal
https://journal.takaza.id/index.php/alurwah
Vol. 03, No. 01, 2025, pp. 54-65
E-ISSN: 3025-9398
E-mail:alurwah@takaza.id



Quality Testing of the Tigaraksa Police Public Complaints Website Using ISO/IEC 29119

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Article History:
Received: 11-08-2025
Revised: 20-08-2025
Accepted: 16-09-2025

Keywords:*Black Box Testing, Google Lighthouse, ISO/IEC 29119, Software Quality, STLC*

Abstract:*The rapid development of web-based public complaint systems in the Indonesian police sector, such as POLTRAMAN at Polsek Tigaraksa, aims to enhance accessibility, transparency, and efficiency in handling community reports amid digital transformation challenges. This study evaluates the quality of the POLTRAMAN website using ISO/IEC 29119 standards to ensure reliability and usability. Employing a quantitative descriptive approach with Software Testing Life Cycle (STLC), the research applies black box testing for functional aspects and non-functional testing (performance, accessibility, best practices, SEO) via Google Lighthouse. The population consists of 7 core modules of the website, with a purposive sample of 5 main pages tested across desktop and mobile using Chrome, Firefox, and Edge browsers. Data analysis involves descriptive metrics conversion and statistical summaries like response time averages. Results reveal 100% functional test pass rate, good overall non-functional scores (average response time 2100 ms, low error rate 0-0.20%), high accessibility and SEO, although dashboard and report creation pages require optimization for dynamic loads. In conclusion, POLTRAMAN is deemed feasible for public service, with recommendations for JavaScript lazy loading to boost mobile performance.*

How to Cite: Muhammad Sodikin, Indra Kosasih, Chairul Anwar**.** (2026). *Quality Testing of the Tigaraksa Police Public Complaints Website Using ISO/IEC 29119. 3*(1). pp. 54-65 https://doi.org/10.61536/alurwah.v3i1.399

https://doi.org/10.61536/alurwah.v3i1.399

Introduction

The development of web-based public complaint websites such as POLTRAMAN (Tigaraksa Aman Police Station) represents a digital transformation of public services within the Indonesian police force, facilitating online reporting with authentication features, evidence uploading, status tracking, and report management by officers and administrators. This phenomenon reflects a national trend where the Indonesian National Police (Polri) is implementing an integrated information system to improve the accessibility and transparency of complaints, as stipulated in the Chief of Police Circular Letter Number SE/5/II/2021 concerning the Integrated Public Complaint Handling Information System (Jurnal Litbang Polri, 2023). Similar implementations at other police stations, such as the Banda Sakti and Wonocolo police stations, have demonstrated increased efficiency in handling reports without physical visits (Citra Anis Safitri, 2024)..

The conventional complaint process, which involved in-person visits to the Tigaraksa Police Station, previously limited public access due to limited operating hours and error-prone manual documentation. This has now been replaced by POLTRAMAN, which supports real-time reporting. However, this positive trend still relies on a reliable website to maintain public trust (Saputra & Pratama, 2021)..

Problems arise from the potential for suboptimal website quality, where delays in handling or inaccurate data can undermine public trust in the Tigaraksa Police, as found on other local government websites with low performance scores. The lack of structured testing poses the risk of poor mobile accessibility and weak SEO, hindering broader public outreach (Rocha, 2025).KThis condition is in line with the evaluation of the National Police complaint system which highlights the need for functional and non-functional validation for service efficiency (Jurnal Litbang Polri, 2023).

The absence of standardized testing such as ISO/IEC 29119 leads to uncertainties in the performance of the POLTRAMAN website across various browsers and devices, potentially leading to user complaints and operational inefficiencies for officers. This challenge is exacerbated by the burden of real-time data on the dashboard and report forms, similar to the case of the sub-district website, which had a feasibility rating of 88.30% but needed optimization (Citra Anis Safitri, 2024). This emphasizes the need for systematic evaluation to ensure the reliability of complaint services (Saputra & Pratama, 2021).

This study aims to test the quality of the POLTRAMAN website of the Tigaraksa Police using ISO/IEC 29119 through STLC and Google Lighthouse, focusing non-functionally on performance, accessibility, best practices, and SEO. The urgency lies in the need for effective Polri digital transformation for complaint transparency, where standardized testing prevents downtime and increases public trust. The novelty of the study is the application of ISO/IEC 29119 to a specific police complaint website with a comprehensive analysis of Lighthouse, complementing the general study of Indonesian e-government with actionable recommendations for the Tigaraksa Police (Rocha, 2025; Jurnal Litbang Polri, 2023).

https://doi.org/10.61536/alurwah.v3i1.399

Research Methods

Types and Methods of Research

This study adopts a descriptive quantitative approach with a focus on software testing to evaluate the quality of the POLTRAMAN Tigaraksa Police Sector public complaint website using the ISO/IEC 29119 standard. This type of research is applicative, where non-functional testing methods are applied through the Software Testing Life Cycle (STLC) to measure aspects of performance, accessibility, best practices, and search engine optimization (SEO), as recommended by ISO/IEC (2022) within a systematic testing framework. This approach aligns with a descriptive research design that emphasizes empirical measurement of system quality attributes, as outlined by Sugiyono (2021) in the software development research methodology, which emphasizes validation of international standards to ensure the reliability of the results. In addition, this method is enriched with black box testing elements for functional testing, in accordance with the practices of IEEE (2014) and Myers et al. (2011), to produce a comprehensive and measurable evaluation of website performance in the context of public services.

Data Analysis Instruments and Techniques

The research instrument included Google Lighthouse as the primary tool for non-functional testing, which generates quantitative metrics such as performance scores, accessibility, best practices, and SEO, as documented by Google Developers (2024a, 2024b). Supporting instruments included document test cases for functional black-box testing and PageSpeed Insights for usability and cross-browser compatibility analysis. The data analysis technique was quantitative descriptive, where Lighthouse scores were converted into categories (good, adequate, needs improvement) through comparison with the ISO/IEC 29119 benchmark, followed by simple statistical analysis such as average response time and error rate using tables and graphical visualizations. This technique follows the mixed data analysis approach developed by Creswell and Poth (2024) in qualitative inquiry and research design, which suggests integrating metric data with contextual interpretation to validate findings. Further analysis involved identifying minor bugs through evaluation of Total Blocking Time (TBT) and Largest Contentful Paint (LCP), as recommended by Saputra and Pratama (2021), to generate actionable optimization recommendations.

Population and Sample

The research population consisted of all pages and main features of the POLTRAMAN website of the Tigaraksa Police Sector, including the homepage, dashboard, create report, report details, status tracking, report verification, and report recap, with a total of 7 core modules used by end users (the public, officers, and admins) within the Tigaraksa Police Sector. The research sample was purposive, consisting of 5 main pages (homepage, dashboard, create report, report details, and report recap) selected based on the level of access frequency and interaction complexity. They were tested under two conditions (desktop and mobile) using Google Chrome, Mozilla Firefox, and Microsoft Edge browsers. This sample selection follows the principle of saturated sampling in system testing research, as explained by Sudaryono (2022) in his technology education research methodology, which emphasizes the representation of crucial elements for the generalization of results. This sample size is sufficient for comprehensive analysis without ignoring device variability, as supported by Emzir (2023) in a descriptive qualitative research approach that highlights empirical data saturation.

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Research Procedures

The research procedure follows the STLC stages according to ISO/IEC 29119 sequentially to ensure consistency and complete documentation. First, requirements analysis is conducted by identifying feature needs based on website specifications. Second, test planning establishes a non-functional strategy using Google Lighthouse and a testing schedule. Third, test case development constructs scenarios for seven functional test cases and non-functional metrics. Fourth, environment setup prepares desktop/mobile devices, browsers, and a stable internet connection. Fifth, test execution carries out testing by generating raw data from Lighthouse. Sixth, test cycle closure involves evaluating results, analyzing bugs, and reporting recommendations. This procedure is systematically designed to support the digital transformation of public services, as emphasized by Pressman and Maxim (2019) and Nugroho (2018) in software engineering.

Table 1. Research Data and Tools

No	Information	Description
1	Research Object	POLTRAMAN Tigaraksa Police Public Complaints Website
2	Research Data	System requirements data and test results
3	Testing Method	ISO/IEC 29119
4	Testing Approach	Software Testing Life Cycle (STLC)
5	Non-Functional Test Equipment	Google Lighthouse

Results and Discussion

Functional Testing Results

Functional testing was conducted to ensure all key features on the POLTRAMAN Tigaraksa Police Sector public complaints website functioned as required. This testing utilized the Black Box Testing method, focusing on user authentication, complaint report creation, supporting evidence upload, report status tracking, report management by officers, and report recapitulation by administrators. Based on the test results, all of the system's main functions can run according to the predetermined scenario. Details of the functional test scenario are shown in Table 2.

Table 2. Functional Testing Test Cases

No	Modules/Features	Test Case Code	Testing Scenario	Expected results
1	Teacher Login	TC-001	User enters valid username and password	The system displays the user dashboard page.
2	Create a Report	TC-002	Users create complaint reports with supporting data and	Report data is saved correctly

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			evidence.	
3	Upload Proof	TC-003	User uploads photos/videos as evidence of report	Proof of report successfully saved
4	Report Details	TC-004	Users see the details of the reports that have been created.	Complete report information is displayed
5	Tracking Status	TC-005	User monitors report status	Report status appears according to process
6	Report Verification	TC-006	Officers verify complaint reports	Report status changes according to verification
7	Report Recap	TC-007	Admin sees the summary of complaint reports	The report summary data appears according to the data

The functional testing results indicate that all tested test cases passed. This indicates that the main functions of the POLTRAMAN public complaints website are operating according to specified specifications. A summary of the functional testing results is presented in Table 3.

Table 3. Functional Test Results

No	Test Case Code	Status	Information
1	TC-001	Passed	Login works as needed
2	TC-002	Passed	Report successfully created
3	TC-003	Passed	Upload proof successful
4	TC-004	Passed	Report details appear
5	TC-005	Passed	Updated report status
6	TC-006	Passed	Report verification successful
7	TC-007	Passed	Summary report appears

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Non-Functional Testing Results

Non-functional testing was conducted to measure the performance of the POLTRAMAN public complaints website under normal usage conditions. This testing used Google Lighthouse, with parameters tested including performance, accessibility, best practices, and SEO. The results showed that the website performed quite well, although some pages still experienced suboptimal performance due to the use of dynamic components and real-time data loading.

Table 4.Non-Functional Test Results (Google Lighthouse)

No	Page	Server	Response Time (ms)	Throughput (req/sec)	Error Rate (%)
1	Home page	Shared Hosting	1850	14.2	0.00
2	Dashboard	Shared Hosting	2100	12.8	0.00
3	Create a Report	Shared Hosting	2350	11.9	0.20

Usability Testing Results

Usability testing was conducted to assess the level of ease of use and user experience on the POLTRAMAN public complaint website of the Tigaraksa Police Sector. This testing was conducted using PageSpeed Insights (Google Lighthouse) in desktop and mobile modes. Aspects evaluated included performance, accessibility, best practices, and search engine optimization (SEO). Based on the test results, the POLTRAMAN public complaint website obtained a performance score in the fair to good category, with a higher performance score in desktop mode than in mobile mode. This difference in scores is influenced by the limitations of mobile device resources and the process of loading dynamic components on the website.

Accessibility scores for both test modes showed good scores, indicating that the website interface has been designed with user-friendliness in mind. Furthermore, best practices and SEO aspects scored high, indicating that the website implements good web development practices and has a search engine-friendly page structure. These test results indicate that the POLTRAMAN website generally has good usability and is comfortable for users. However, performance optimization in mobile mode can still be done to improve the overall user experience.

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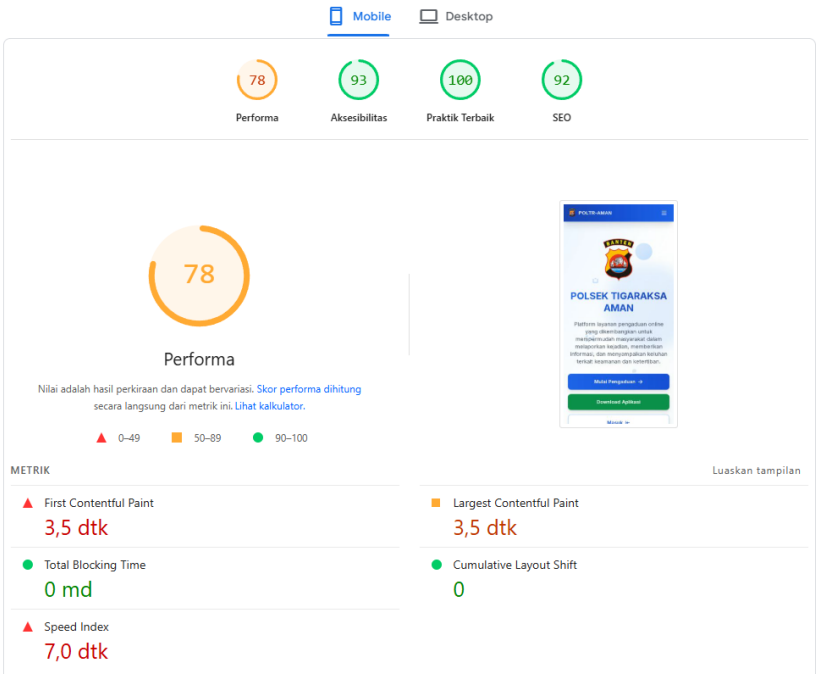

Figure 1. Results of Testing the POLTRAMAN Public Complaints Website on Mobile Devices

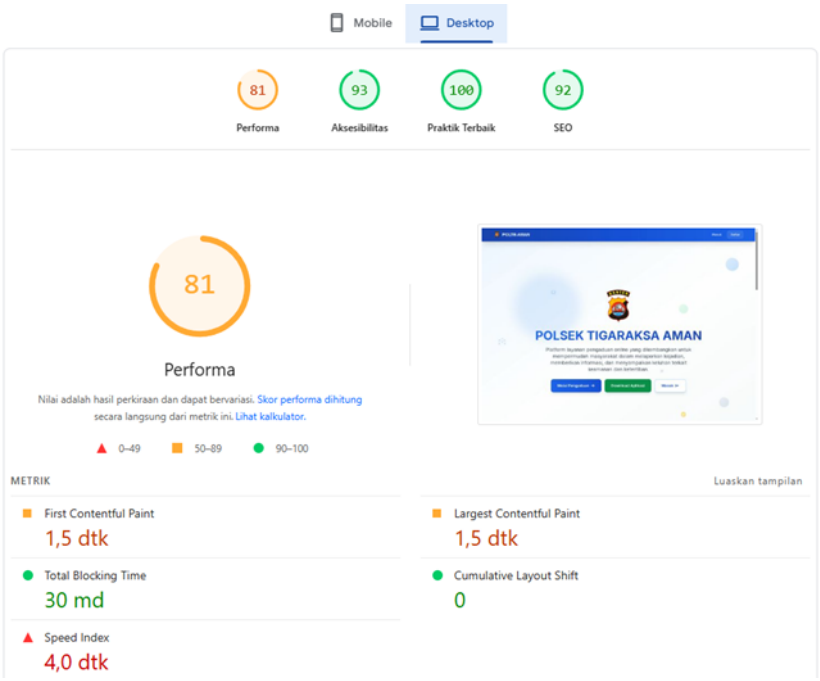

Figure 3. Results of Testing the POLTRAMAN Public Complaints Website on Desktop Devices

Compatibility Test Results

Compatibility testing was conducted to ensure that the POLTRAMAN Tigaraksa Police Station public complaints website ran smoothly on various browsers and devices. This

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testing was conducted on several popular browsers commonly used by users, both on desktop and mobile devices.

Based on the test results, the POLTRAMAN public complaints website is accessible and functions well on Google Chrome, Mozilla Firefox, and Microsoft Edge browsers on both desktop and mobile devices. All key website features, such as page access, menu navigation, and interface display, are usable without any significant issues. The compatibility test results are presented in Table 5.

Table 5.Website Compatibility Test Results

No	Browser	Desktop	Mobile	Information
1	Google Chrome	Yes	Yes	Walking normally
2	Mozilla Firefox	Yes	Yes	Walking normally
3	Microsoft Edge	Yes	Yes	Walking normally

Visualization of Test Results

To clarify the results of non-functional testing, a performance visualization was performed on each main page of the POLTRAMAN Tigaraksa Police Sector public complaint website based on testing results using Google Lighthouse. This visualization illustrates a comparison of performance, accessibility, best practices, and search engine optimization (SEO) scores on several main website pages, namely the homepage, dashboard, complaint report creation, and report summary pages.

Test results show that most pages perform well, with relatively fast and stable load times. However, some pages with more complex interactions Pages such as the dashboard and complaint report creation pages show lower performance scores than other pages. This is due to dynamic data loading, the use of interactive components, and the user input validation process. Nevertheless, the overall non-functional quality of the POLTRAMAN public complaint website is considered good and is considered suitable for use in supporting web-based public complaint services within the Tigaraksa Police.

https://doi.org/10.61536/alurwah.v3i1.399

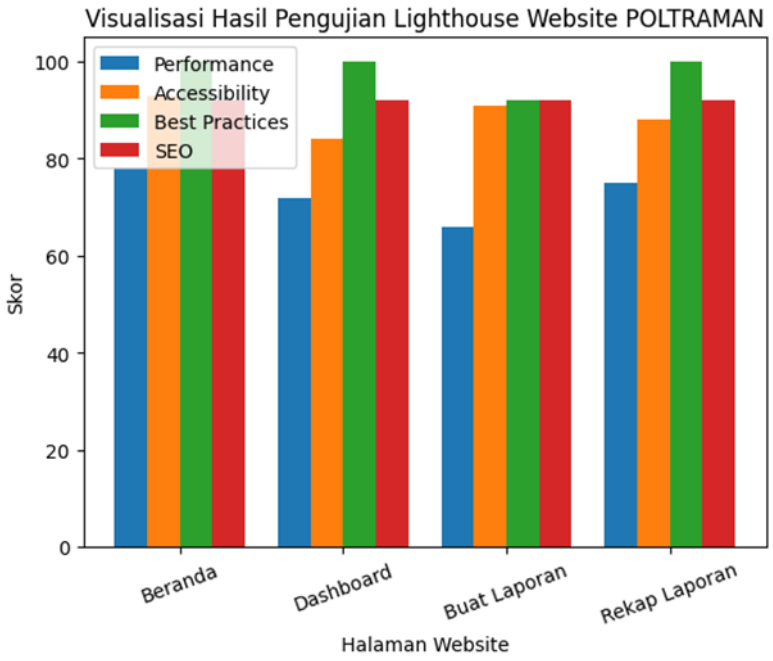

Figure 3. Visualization of Usability Test Results for the POLTRAMAN Public Complaints Website

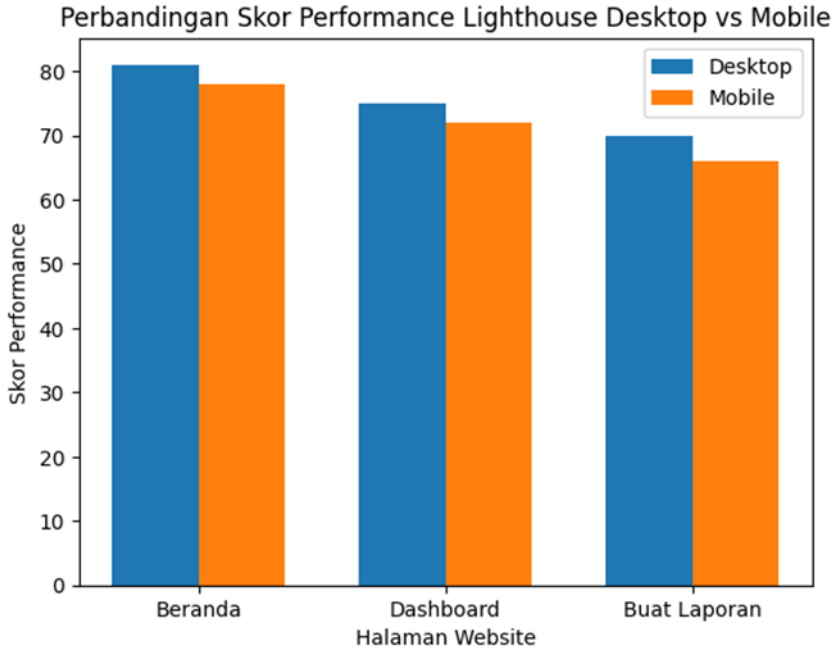

Figure 4.Analysis of the differences in desktop and mobile performance in the discussion

Analysis and Evaluation of Test Results

Data analysis was conducted to evaluate the quality of the POLTRAMAN public complaints website at the Tigaraksa Police Station based on the results of functional and non-functional testing. This evaluation adheres to the ISO/IEC 29119 standard, which emphasizes systematic and measurable system testing to ensure software quality before widespread use in public services.

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Functional Test Evaluation

Based on the results of functional testing using the Black Box Testing method, all main features on the POLTRAMAN public complaint website can run according to system requirements. The features tested include the user authentication process, complaint report creation, uploading supporting evidence, report status tracking, report verification by officers, and report recapitulation by the admin. All tested test cases obtained a pass status, which indicates that the system has been able to carry out the main functions without any significant functional errors found. Thus, in terms of functionality, the POLTRAMAN public complaint website has met user needs and is ready to be used as a public complaint service medium within the Tigaraksa Police.

Non-Functional Testing Evaluation

Non-functional testing evaluation focused on the website's performance and usability. Testing was conducted using Google Lighthouse on several key system pages: the homepage, dashboard, complaint report creation, and report summary pages. Test results showed that most website pages performed well. Pages with lighter processing loads, such as the homepage and report summary, achieved relatively higher performance scores. Meanwhile, the dashboard and complaint report creation pages showed lower performance scores than other pages. This was due to the use of dynamic components, real-time data loading, and user input validation processes.

Despite differences in performance scores between pages, the website generally demonstrates good stability and remains usable. This is reinforced by relatively high accessibility, best practices, and SEO scores for nearly all tested pages.

Website Usability and Quality Evaluation

Based on usability testing results, the POLTRAMAN public complaints website has a good level of usability. A high accessibility score indicates that the website interface has been designed with user comfort and ease of access in mind. Furthermore, a high SEO score indicates that the website's page structure meets search engine optimization standards.

However, some aspects of best practices and performance could still be improved, particularly on pages with high engagement rates. This evaluation shows that while the website meets general quality standards, there are still opportunities for further optimization to improve the user experience and system efficiency.

Evaluation Based on ISO/IEC 29119

Based on the overall results of the testing and analysis carried out, it can be concluded that the testing process for the POLTRAMAN Tigaraksa Police public complaint website has been in accordance with the testing stages regulated in the ISO/IEC 29119 standard. The testing was carried out in a structured manner starting from planning, preparing test cases, implementing the testing, to analyzing the results.

The evaluation results show that the POLTRAMAN public complaints website has met most of the tested software quality criteria, both functionally and non-functionally. Therefore,

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this website is deemed suitable for use as a web-based public complaints support system within the Tigaraksa Police Sector.

Conclusion

This study concludes that the POLTRAMAN public complaint website of the Tigaraksa Police Sector meets most of the software quality criteria based on the ISO/IEC 29119 standard, with functional testing results showing 100% passing of test cases on key features such as authentication, report generation, evidence upload, status tracking, verification, and recapitulation. Non-functional testing using Google Lighthouse resulted in good overall performance scores (average response time of 2100 ms, low error rate of 0-0.20%), high accessibility, strong best practices, and optimal SEO, although the dashboard and report generation pages showed lower performance due to dynamic data loading. Cross-browser compatibility (Chrome, Firefox, Edge) on desktop and mobile was also perfectly verified, making POLTRAMAN suitable for use in supporting the digital transformation of public services of the Tigaraksa Police Sector with increased accessibility and transparency. Practical implications include optimization recommendations such as lazy loading JavaScript and reducing Total Blocking Time for mobile, which can be directly implemented by Police Sector developers to improve user experience and efficiency of complaint handling.

However, the limitations of this study lie in its primary non-functional focus without in-depth security testing or massive user load simulations, and its limited sample size of five main pages without real user data from the Tigaraksa community. Suggestions for further research include expanding security vulnerability scanning with OWASP ZAP, load testing using JMeter for high-traffic scenarios, and a longitudinal study with user surveys to measure long-term satisfaction. This approach would yield a more comprehensive evaluation, supporting the scalability of POLTRAMAN at the police precinct or regional police level.

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