Subject: SECV2223 Web Programming


Section: 01


Assignment 1


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Group 6: Beauties

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**Introduction**

In the fast-evolving digital economy, e-commerce websites serve as vital platforms that bridge businesses and consumers across the globe. Website performance determines the success of these platforms as it impacts not only the user experience, customer engagement, and conversion rates, but also the quality of the user experience. Modern web users demand fast page load speeds, outstanding visuals, and high search engine rankings. Even a two-second delay in page load time can lead to a significant increase in bounce rates and a decrease in customer satisfaction.

As the market becomes increasingly competitive, online retailers invest heavily in website optimization to provide customers with excellent performance while satisfying search engine requirements. Web developers and digital marketers rely on Google Lighthouse to get the necessary resources to evaluate and optimize multiple website components. The open source Lighthouse system provides performance, accessibility, SEO (search engine optimization), and best practices assessments and generates website optimization solutions.

We used Google Lighthouse to analyze five major e-commerce websites: Amazon, eBay, Shopee, Lazada, and Zalora. These websites were selected because of their widespread market success with local and global users. The Lighthouse audit analysis helped us detect the performance level of the website in terms of technical efficiency, usability, and search readiness.

The main goals of this evaluation process are:

- Identify the strengths and weaknesses of each website based on quantitative Lighthouse metrics.
- Understand how each platform approaches optimization.
- Provide improvement recommendations tailored to each website's audit results.

Through this study, we gain valuable insight into the current best practices in the e-commerce domain, and how web performance auditing can contribute to achieving superior digital user experiences. The findings are intended not only to assess the current state of these platforms but also to highlight optimization strategies that can benefit e-commerce businesses more broadly.

**Website Selection**

The following websites were chosen based on global popularity, regional relevance, and high visitor traffic:

| No | Website | URL |
|---|---|---|
| 1. | Amazon | https://www.amazon.com/ |
| 2. | eBay | https://www.ebay.com/ |
| 3. | Shopee | https://shopee.com/index.html |
| 4. | Lazada | https://www.lazada.com.my/# |
| 5. | Zalora | https://www.zalora.com.my/ |

*Table 1: Choices of Website*

These websites represent a mix of global and Southeast Asian platforms, making them ideal for comparison in terms of performance and optimization practices.

**Audit Methodology**

Each website was audited using Google Lighthouse via Chrome DevTools. The tests were conducted in Desktop mode using a consistent network environment to ensure fairness.

The Lighthouse report evaluates four main categories:

- Performance: Page speed, loading time, and interactivity

- Accessibility: Usability for all users, including those with disabilities

- SEO: Search engine optimization and metadata presence

- Best Practices: Security, coding standards, and technical health

The audit was conducted on 12-13 April 2025. All data presented is based on the homepage of each respective website.

**Audit Result**

| | Performance | Accessibility | Best Practices | SEO |
|---|---|---|---|---|
| **Amazon** | 68 | 88 | 93 | 100 |
| **eBay** | 56 | 70 | 70 | 77 |
| **Shopee** | 92 | 78 | 100 | 83 |
| **Lazada** | 54 | 54 | 78 | 92 |
| **Zalora** | 70 | 90 | 71 | 92 |

*Table 2: Table of Website*

**Analysis of Results**

The analysis is conducted based on the audit done using the Google Lighthouse. Based on the Lighthouse report that evaluates performance, accessibility, best practices and SEO.

For the performance, Shopee with 92 hits the highest mark followed by Amazon (68), Zalora (70) and eBay (56). Lazada with only 56 is the lowest mark for performance. For accessibility, Amazon (88) and Zalora (90) have high marks which are above 80 while Shopee has 78, eBay (70) and Lazada with 54 again is the lowest mark. Look into the best practices, Shopee has the full marks. Amazon with 93 and Lazada with 78 marks. eBay and Zalora scored almost the same, which is 70 and 71 marks. For SEO, Amazon scored full marks followed by  Lazada and Zalora with 92 marks. Shopee scored 83 while eBay scored 77.

Shopee overall has the best for performance and best practices while Amazon has the best for accessibility and SEO. eBay's strength is on the accessibility part while Lazada performs well in SEO. Zalora has better performance compared to eBay and Lazada.

Shopee which has higher marks in most of the field has weakness in its accessibility but still stands out. Amazon's performance has some gaps with the best result. eBay's and Zalora's overall results are above average but both have weakness in their performance. Lazada shows the worst result among the five websites especially for performance (57) and accessibility (54).

**Recommendations & Conclusion**

1. Lazada:

- Performance and accessibility: Lazada had the lowest scores in both performance (54) and accessibility (54). To improve, Lazada should optimize its images, minimize unused JavaScript, and reduce render-blocking resources. Accessibility can be enhanced by improving contrast ratios, adding descriptive alt texts for images, and ensuring keyboard navigability.

2. eBay:

- Performance: With a score of 56, eBay would benefit from compressing large resources, improving server response times, and utilizing efficient caching strategies.

3. Shopee:

- Accessibility: Despite excellent scores in performance and best practices, Shopee scored only 78 in accessibility. Enhancements can be made by ensuring sufficient text contrast, labeling form elements, and using accessible ARIA roles where necessary.

4. Zalora:

- Best Practices & Performance: Zalora should address security and technical health issues to improve from a score of 78 in best practices. Performance optimizations can also be introduced to boost the current score of 70, such as reducing third-party scripts and eliminating layout shifts.

5. Amazon:

- Performance: Although Amazon scored highly overall, its performance (68) still leaves room for optimization. Streamlining scripts, deferring offscreen images, and reducing initial server response times could push this score even higher.

To sum up, Shopee emerged as the top performer, leading in both performance and best practices, with a solid standing in SEO. Amazon excelled in accessibility and achieved a perfect score in SEO, demonstrating its strong backend optimization and user-friendly interface. While eBay and Zalora showed moderate results with specific strengths, Lazada significantly lags behind across most categories and requires urgent improvements.

By addressing their respective weaknesses, each platform can provide a more seamless, inclusive, and optimized user experience. Furthermore, ongoing performance audits like Lighthouse are essential for maintaining competitiveness in the rapidly evolving e-commerce space.

# References

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2. Author links open overlay panelSelcuk Cebi *et al.* (2012a) *A quality evaluation model for the design quality of online shopping websites*, *Electronic Commerce Research and Applications*. Available at: https://www.sciencedirect.com/science/article/abs/pii/S1567422312001214 (Accessed: 15 April 2025).

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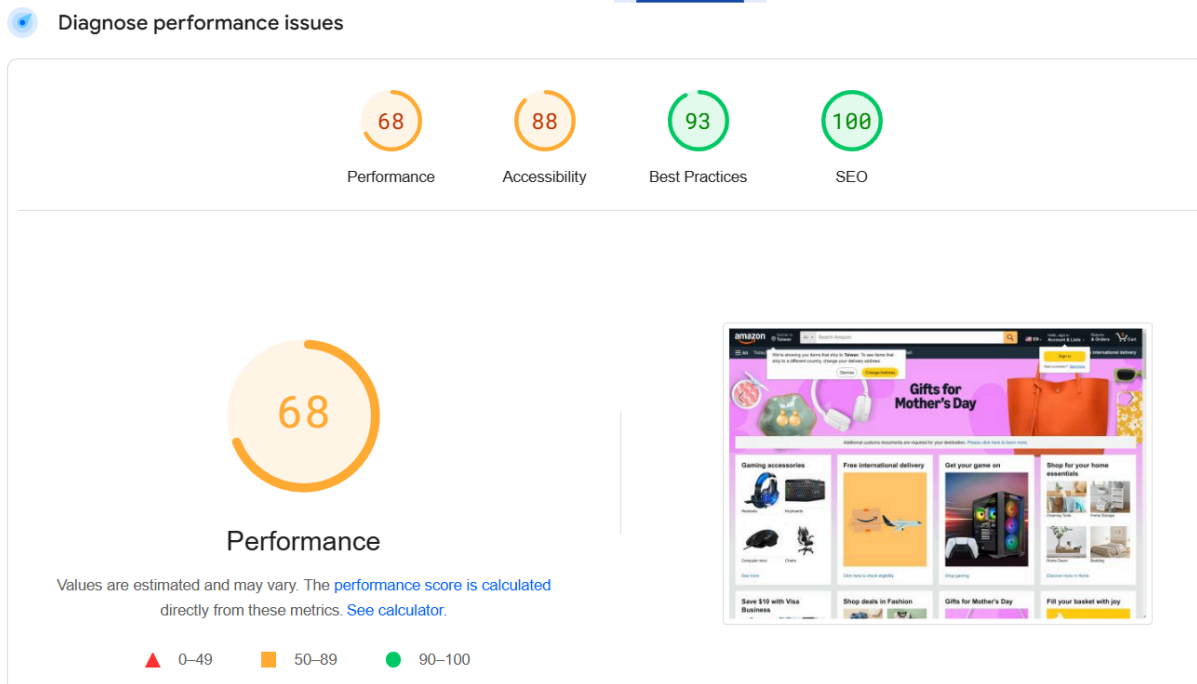
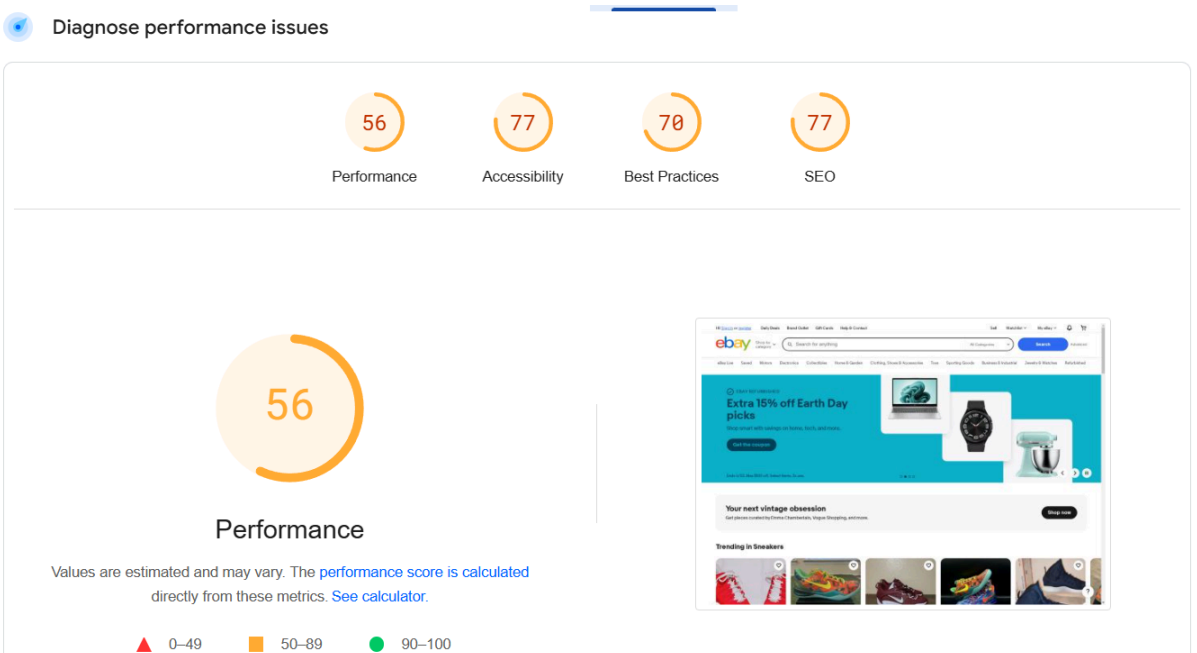*Figure 1: Lighthouse Report for Amazon*



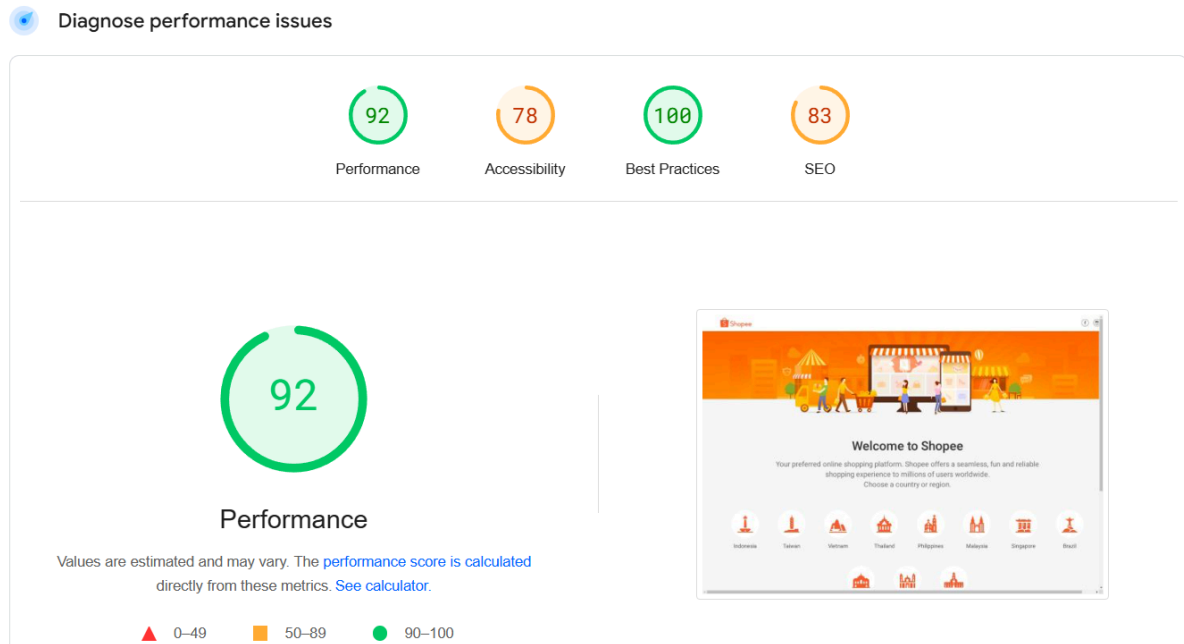*Figure 2: Lighthouse Report for eBay*

*Figure 3: Lighthouse Report for Shopee*



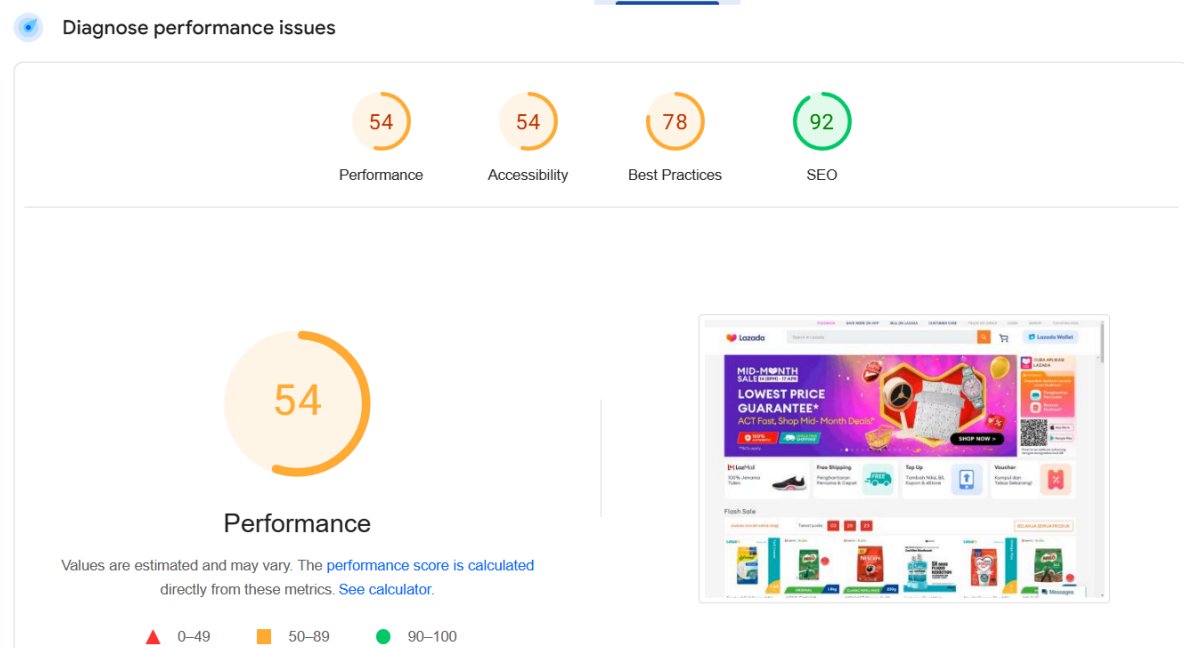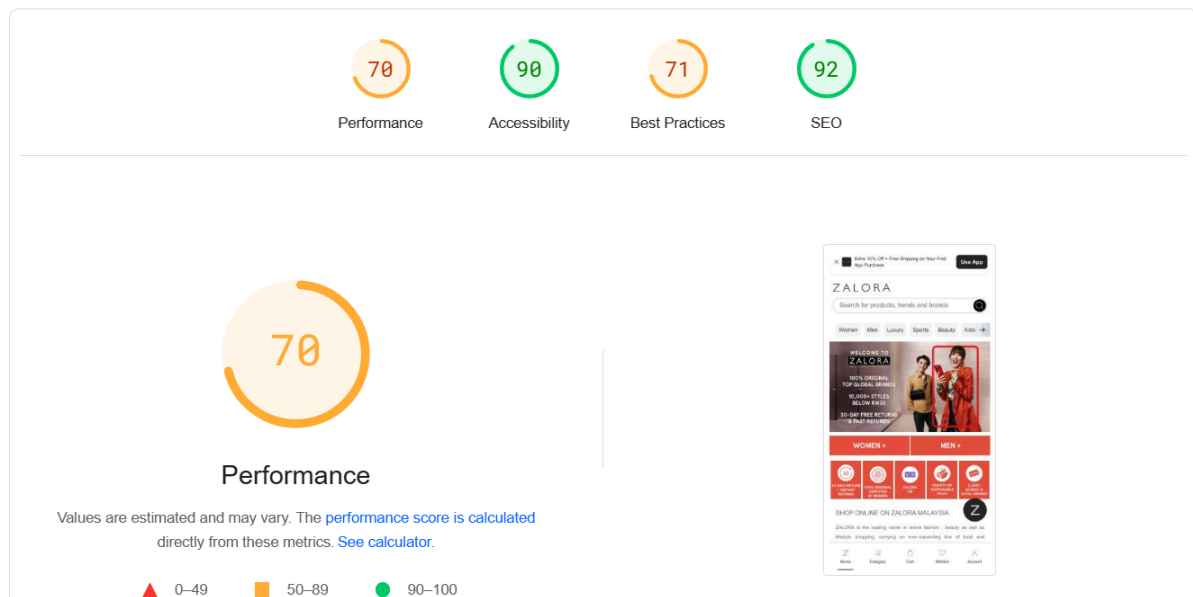*Figure 4: Lighthouse Report for Lazada*

Diagnose performance issues



*Figure 5: Lighthouse Report for Zalora*