Comparative Evaluation of Streaming Service Websites using Google Lighthouse

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1. Introduction

Based on an article published by Forbes called “The Best Streaming Services For 2024”, we have chosen Netflix, Hulu, Amazon Prime Video, Disney +, and Apple TV + websites to undergo a Web Performance Audit. To audit, we will be using Google Lighthouse which is an open-source automated audit tool. It will assist in improving the quality of the website by generating performance, accessibility, best practices, and Search Engine Optimization (SEO) analysis.

2. Performance Reports' Findings

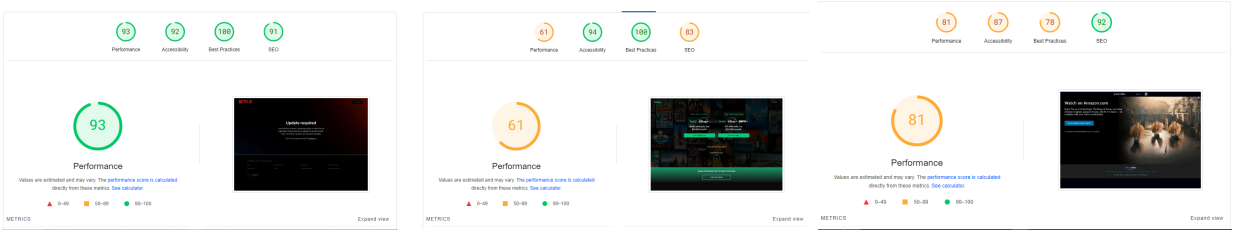

Fig. 1: Netflix, Hulu and Amazon Prime Audit Results

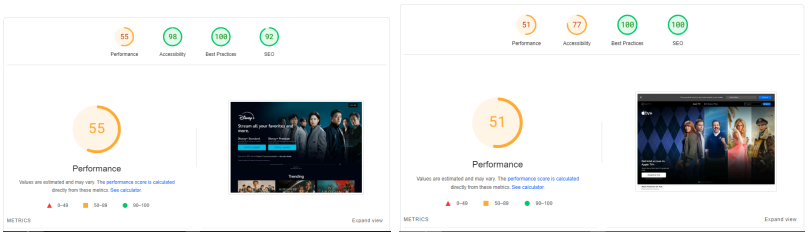

Fig. 4: Disney + *and* Apple TV +*Audit Results*

Table 1: Google Lighthouse Analysis Result Recapitulation of Chosen Websites

No	Streaming Service Websites	Google Lighthouse Analysis Results			
		Performance	Accessibility	Best Practices	SEO
1	Netflix	93	92	100	91
2.	Hulu	61	94	100	83
3.	Amazon Prime Video	81	87	78	92
4.	Disney +	55	98	100	92
5.	Apple TV +	51	77	100	100

3. Strengths and Weaknesses

3.1 Netflix

For the strengths, performance for netflix has a score of (93). This is because Netflix's initial server response time is short, avoiding large layout shifts, steer clear of enormous network payloads, minimize main-thread work as well as minimize third-party usage. Next, the accessibility has a great score of (92) because the ARIA IDs are unique and no form fields have multiple labels. Then, the best practices have a perfect score of (100) to ensure CSP is effective against XSS attacks and the page has valid source maps. Furthermore, the search engine optimization (SEO) has a good score of (91). The reasons are netflix page has successful HTTP status code, document has a valid hreflang and document avoids plugins. However, Netflix may face weaknesses related to accessibility features such as disabling zooming is problematic for users with low vision and lots of data consumption.

3.2 Hulu

Hulu gets noteworthy ratings all around and exhibits outstanding strengths in a number of categories. With a pristine (100) best practices score and a (94) accessibility rating, Hulu guarantees a safe and easy viewing experience for its users. With an SEO score of (83), there is still space for development in terms of search engine performance and visibility optimization. Hulu's performance is evaluated at (61), however there are still issues that affect speed and efficiency, like render-blocking resources and picture optimization. Notwithstanding these

potential improvement areas, Hulu's attention on accessibility and best practices highlights its resolve to provide a secure and legal streaming experience.

3.3 Amazon Prime Video

The Amazon Prime Video app shows remarkable improvements in a number of different parameters. It achieves quick loading times and effective resource usage with an 81% performance score. An 87% score indicates strong accessibility initiatives that improve usability. Its 92% SEO optimization score also guarantees top placement in search engine results. Its usefulness is however diminished by flaws like the absence of mobile-friendly meta viewport tags and accessibility problems. Security issues highlight areas that need to be improved, such as obsolete APIs and the lack of an efficient Content Security Policy (CSP). With a 78% score, best practices also need to be followed to guarantee peak performance, accessibility, and security requirements, which will improve the user experience as a whole.

3.4 Disney +

Disney+ gets a great score of (98). Disney+ excels in providing an exceptional user experience for all individuals. One of the reasons for the high accessibility score is the sufficient contrast ratio between background and foreground colors. Furthermore, Disney+ also got a perfect score of (100) for best practices. Disney+ adheres to industry standards and follows recommended practices for web development. However, Disney+ unfortunately gets the second-lowest score in terms of performance(55). Disney+ mainly faces challenges related to the loading speed of the website. Slow performance can cause user frustration, when streaming content.

3.5 Apple TV +

Apple TV+ gets a perfect score of (100) in terms of best practices. Apple TV+ demonstrates a commitment to industry standards and follows recommended practices for web development. By adhering to best practices, the platform ensures a consistent and reliable experience for users across different devices and browsers. However, Apple TV+ gets a score of (50) in performance. Apple TV+ faces challenges related to loading speed. Slow performance can lead to user frustration, especially when streaming content or navigating through the platform. In addition, Apple TV+ scores (77) in the accessibility audit.

4. Compare and Contrast

4.1 Netflix

When comparing Netflix, Hulu and Amazon Prime Video based on Google Lighthouse audits insights emerge. Netflix focuses on optimizing content delivery for faster loading times while Hulu efficiently encodes images for a smoother streaming experience. Both platforms have room for improvement in eliminating render-blocking resources. Amazon Prime Video excels in delivering visually impactful content promptly. However, all three face challenges like unused JavaScript and CSS, layout shifts, and excessive network payloads indicating areas for optimization to enhance performance and user experience.

4.2 Hulu

Hulu's desktop app performs marginally worse at (61) but excels in accessibility and best practices, achieving (94) and (100) respectively. It can do better in areas like Total Blocking Time and Cumulative Layout Shift, even though it performs admirably in measures like First Contentful Paint and Largest Contentful Paint. Diagnostics show where improvements can be made in terms of server response time, image formats, and the amount of unnecessary JavaScript and CSS. Even with adherence to security protocols such as Content Security Policy, ARIA compliance can be enhanced, especially when proper roles and unique IDs are used. Overall, even though Hulu places a high priority on best practices and accessibility, performance optimization and adhering to ARIA standards might improve the user experience even more.

4.3 Amazon Prime Video

Fast FCP and consistent analytics are only two examples of Amazon Prime Video's impressive speed. On the other hand, problems like resource optimization and LCP require consideration. Even though accessibility is excellent, there are still important issues that need to be fixed, like form labels and color contrast. There are mixed feelings about following recommended practices due to worries about CSP efficacy and deprecated APIs. While it does well in terms of SEO, it is not mobile-friendly due to the absence of a meta viewport tag. Overall, it's good for SEO and performance, but it might be better for accessibility and following current web standards.

4.4 Disney +

Disney+ stands out in the accessibility field and best practices compared to other streaming services websites. Its commitment to inclusivity and adherence to industry standards contribute to a positive user experience. However, the platform faces challenges in terms of performance compared to its rivals, which impacts the loading times of the websites. The main causes of the low-performance score of Disney+ are high first contentful paint, largest contentful paint, and speed index. Disney+ needs to balance accessibility with optimal performance which is crucial to increase the overall score for the website.

4.5 Apple TV +

Apple TV+ stands out in SEO compared to other streaming services websites, Apple TV+ ensures its content reaches a wide audience through search engines. However, it needs improvement in performance and accessibility to enhance the overall user experience. The platform should prioritize features such as closed captions, screen reader compatibility, and keyboard navigation to improve accessibility for all users. Apple TV+ can be a strong contender to other video streaming service websites if they can improve their lack of accessibility and performance.

5. Recommendations for Optimization and Improvement

5.1 Netflix

Netflix should focus on making an investment in optimized images load faster and consume less cellular data. Additionally, improving by eliminating render-blocking resources can significantly enhance page load times and overall user experience.

5.2 Hulu

Performance can be improved by lowering the initial server response time and optimizing image sizes and formats in order to enhance the Hulu desktop experience. By ensuring unique ARIA IDs and fixing ARIA role nesting, accessibility can be improved. By enforcing an effective Content Security Policy (CSP) against XSS attacks and routinely updating JavaScript libraries, you may strengthen security and trust measures. To further improve performance and the user experience, address errors and alerts pertaining to missing resources and inefficient asset delivery.

5.3 Amazon Prime Video

Use next-generation picture formats, minimize render-blocking resources, and minimize unneeded JavaScript/CSS in order to maximize performance. By enhancing color contrast, marking form elements, and carrying out manual checks, they can improve accessibility. By avoiding outdated APIs and putting in place a strong CSP to thwart XSS attacks, adhere to best practices. Make sure the page is responsive by including a <meta name="viewport"> element. Finally, keep SEO strong by making sure meta tags are optimized and that contents are search engine accessible. These actions will improve visibility and user experience.

5.4 Disney +

The main recommendation for improvement for Disney+ is optimizing their loading times which can be done by evaluating and streamlining the loading process. In addition, critical content must be prioritized to ensure a faster initial load, especially for users on slower connections or mobile devices.

5.5 Apple TV +

As usual, the first recommendation for improvement of the website is to optimize the loading times by reducing unused JavaScript and minimizing main-thread work. Prioritize critical content to ensure a faster initial load, especially for users on slower connections or mobile devices.

6. Citation

1. Fitzgerald, T.(2024 Jan 3). *The Best Streaming Services For 2024*. Forbes. https://www.forbes.com/sites/entertainment/article/best-streaming-services/?sh=2d84c5bf7ec1