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Report: Comparative Evaluation of 6 Popular Social Media Websites Using Google Lighthouse Matrix

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1. Introduction

In this modern era, social media platforms have become a necessary part of our daily lives, allowing seamless communication, information sharing, and virtual interactions among humans. The popularity of social media platforms is very obvious because billions of users are actively engaging on these virtual spaces. According to reputable sources from Malaysia Social Media Statistics and Facts 2024 compiled from Commission Factory website [1], the most popular social media platforms in Malaysia include Facebook, YouTube, Instagram, LinkedIn, TikTok, and so on, each serving a variety of user demographics and preferences.

Social Network	Number of Active Users (millions)	Percentage of Total Internet Users (16 to 64)	Ad Reach as a Percentage of Total Population
YouTube	23.90	93.2%	70.0%
Facebook	20.25	84.8%	59.3%
Instagram	13.90	74.3%	40.7%
TikTok	19.30	59.9%	56.6%
FB Messenger	11.20	55.8%	32.8%
Twitter	5.50	47.5%	16.1%
LinkedIn	7.00	25.9%	20.5%
Snapchat	1.45	16.1%	4.2%

Figure 1: Most Popular Social Media Platforms in Malaysia

These social media platforms have a huge number of active users due to their ability to provide outstanding performance and user experience. To evaluate and optimize performance of each website, developers normally use tools like Google Lighthouse, an open-source automated audit platform designed to assess various aspects, including performance, accessibility, best practices, Search Engine Optimization (SEO) and Progressive Web Apps (PWA). This tool allows developers to run a basic SEO Health Check on a web page to identify areas that need improvement in order to improve the overall user experience of the platforms.

In this research, we aim to conduct a comparative evaluation among 6 of the popular social media websites which are YouTube, Facebook, TikTok, Instagram, Twitter and LinkedIn, by using the Google Lighthouse. Besides that, we are expected to provide some solid recommendations based on our findings in order to further enhance the overall performance and user experience, which helps in optimization and improvement for each website.

2. Literature Review

2.1 YouTube
YouTube, launched in 2005, is a video-sharing platform that has revolutionized a new method that allows people to create and share video contents in the form of online. By 2024, YouTube already has over 2.70 billion active users worldwide, making it one of the most popular platforms on the internet. YouTube provides a good user experience since YouTube can provide up to 80 languages and a wide variety of video content across different cultures and categories such as kid channels, movies, music, product reviews, news and so on [2].

2.2 Facebook
Facebook, founded in 2004, is a social networking platform that has transformed the people from physically connecting and sharing information to the online mode. As of the second quarter of 2023, Facebook already has over 3.05 billion monthly active users, making it the largest social media platform globally. Statisticians already predict that Facebook will reach 75% of the world's population as their users by 2027 [3].

2.3 TikTok

TikTok, a relatively new social media platform launched in 2016, has become popular worldwide due to its short-form video content. TikTok already achieved 1.92 billion users in 2023, a 16% increase compared to the previous year. Besides, TikTok is expected to reach 2 billion by the end of 2024. This situation happened due to its unique algorithm and user-friendly interface that have provided a comfortable platform for content creators and users alike [4].

2.4 Instagram

Instagram, launched in 2010, is a photo and video-sharing social networking platform that has become a cultural phenomenon among the new generation. By 2024, Instagram has more than 2 billion monthly active users, making it one of the most popular social media platforms globally. Instagram has revolutionized the way people to share visual content, influencing the future trends in photography, fashion, and lifestyle. More than half of the Instagram users use Instagram to check information about the brands and products such as product feedback from others [5].

2.5 Twitter

Twitter, founded in 2006, is a microblogging platform that has become a famous source that is rich with real-time information and social comment. In November 2022, Twitter had over 259 million active users, making it a popular platform for news, discussions, and social movements worldwide. The unique feature of 280-character tweets in Twitter has made it a platform for concise and rapid communication among the users, influencing various industries and aspects, including journalism, politics, and marketing [6].

2.6 LinkedIn

LinkedIn, launched in 2003, is a professional networking platform that has become an essential tool for career development and business networking. As of 2024, LinkedIn has over 900 million users worldwide, making it one of the largest professional networking platforms globally. LinkedIn has become a valuable resource for business-oriented individuals due to its features such as job postings, company pages, and skill endorsements across various industries. LinkedIn is expected to have a user population of 1 billion by 2025. [7].

3. Result and Analysis

Based on the data collection that was obtained on April 13, 2024, the analysis and testing are continued with the scan results that have been obtained using Google Lighthouse data obtained:

No	Social Media Platform	Google Lighthouse Analysis Result				
		Performance	Accessibility	Best Practices	SEO	PWA
1	Youtube	53	85	78	100	-
2	Facebook	60	86	74	89	✔
3	TikTok	32	63	74	83	✔
4	Instagram	38	89	78	96	✔
5	Twitter	46	93	100	92	✔
6	LinkedIn	66	93	96	85	-

Table 1: The Google Lighthouse Analysis Result for 6 Social Media Platforms

Based on the table 1 above, it is clearly shown that each platform has its strengths and weaknesses in various aspects of website performance. First and foremost, YouTube which excels in SEO (100) to increase the probability of videos uploaded in YouTube able to be searched and found by the users. This is because YouTube will optimize the elements such as video titles, descriptions and tags, in order to make the videos easier to match the requirements of the users under the YouTube's search algorithm. However, YouTube shows weaknesses in performance (53) and accessibility (85). Besides, YouTube is considered a traditional web application, not a PWA.

Next, Facebook shows a balanced performance with moderate scores across all aspects. For example, Facebook hits scores of 60 in performance, 86 in accessibility and 89 in SEO. However, Facebook has the lowest score in best practices(74) which is similar to TikTok and this should be improved to ensure a user trust data collection. Facebook is identified as a PWA, showing it has made an effort to improve user experience. However, there is still space for improvement in all aspects in Facebook to further enhance its overall performance metrics.

Furthermore, TikTok faces challenges in all areas. TikTok scores the lowest marks in performance (32), accessibility (63), best practices (74) which is similar to Facebook and SEO (83) among the 6 social media platforms. This situation is due to TikTok lack of mature development practices since it has the shortest lifetime. However, it is identified as a PWA, which could push notifications to its users to attract them to use the TikTok.

Additionally, Instagram scores a high mark in accessibility (89) and SEO (96), which shows that Instagram is easily accessed and used by all users. This situation will make the content in Instagram widely discoverable and inclusive for different types of audiences. However, it lags in performance (38) and best practices (78), despite being a PWA. Instagram should improve these areas to ensure a comfortable user experience when using Instagram.

Besides, Twitter shines in accessibility (93) which is equal with LinkedIn and best practices (100). This situation shows that Twitter focuses on controlling inclusive access and enhancing its user experience. Twitter performs moderately in performance (46) and SEO (92). Twitter also has been identified as a PWA, showing it can reach a larger number of audience without the need for multiple app deployments.

Last but not least, LinkedIn excels in performance (66), accessibility (93) and best practices (96). This score can reflect the dedication of LinkedIn to provide a high-quality, inclusive and efficient platform to its users, which can lead to a better user experience. However, Linkedin performs moderately in SEO (85) and is not identified as a PWA, which could be an area for improvement to enhance its user experience further.

4. Recommendations

After a very careful consideration of the analysis, here are some recommendations to optimize and make improvement for 6 platforms we mentioned earlier.

For Youtube, its performance and accessibility should be improved so that it can reach the level of LinkedIn or surpass it in the future. YouTube can use efficient video codecs such as VP9 and AV1 to reduce the file sizes without losing its original quality. YouTube can also improve the semantic structure and navigation by using the proper HTML semantic elements such as <heading>, <nav> and <footer> to ensure a logical structure. YouTube should also develop a PWA version of YouTube so that users can access it offline and have a faster loading time.

In order to achieve an improvement across all aspects in Facebook, it should apply a content delivery network (CDN) so that it can serve static assets to the users from a closer location and this situation can help to reduce the load times. Facebook should also improve their compression techniques to reduce the payload sizes so that Facebook can handle the massive active users at one time. Facebook should implement structured data and schema markup to ensure its users receive more accurate and relative search results, this can improve performance.

TikTok needs to make a lot of improvements since it scores the lowest marks in all aspects. TikTok should implement lazy loading for content and assets, as well as utilize the CDN to improve the loading times. TikTok also should start to provide accurate and synchronized captions and transcripts for all videos in its platforms so that the worldwide users can understand and be attracted by the meaning in each video, this can improve the accessibility.

Instagram can implement techniques such as adaptive bitrate streaming for the videos so that users can enjoy an optimal playback experience. Instagram can prepare responsive design and mobile optimization to ensure user experience across various devices. Instagram should also update and optimize the backend system so that the platform can handle more users and contents that will be uploaded worldwide, this can improve the best practices.

Twitter can use the efficient image and video codecs such as WebP and AVIF to reduce file sizes without losing its initial quality. Twitter should also use lazy loading techniques to focus on loading the important content and assets when users are scrolling or interacting with the platform pages, this can improve the performance.

Lastly, LinkedIn should implement PWA so that its users are not confused when switching from web to app frequently. LinkedIn should optimize the page titles and meta descriptions by ensuring the titles and descriptions are related to content of each post. LinkedIn should implement a strong internal linking structure to help search engines better and faster to understand the relationship between different content on LinkedIn, this can improve the SEO.

5. Conclusion

In a nutshell, based on the analysis and testing carried out in this research using Google Lighthouse on the 6 most popular social media platforms, all were tested based on 5 metrics which are performance, accessibility, best practices, SEO and PWA. It can be concluded that SEO has the most significant impact on the amount of active users since YouTube which excels in SEO (100) has the largest number of active users. From the 6 most popular social media platforms, it can be seen that there are still a lot of aspects that can be improved and optimized, especially the performance since the top score for performance is only 66 from LinkedIn. This aspect should be fixed as soon as possible to provide a better and seamless user experience for the users.

6. Reference

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