Tokopedia and Shopee Marketplace Performance Analysis Using Metrix Google Lighthouse

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Abstract

The development of the marketplace is growing very rapidly and has become familiar in the lives of Indonesian people. The term marketplace has also been imprinted in the general public as a place for buying and selling online without having to meet physically. In practice, the marketplace has also provided a lot of convenience and comfort in shopping, starting from transaction security and selection of varied shopping items, also equipped with estimates in shipping. It doesn't stop there; the development of the marketplace has also penetrated almost all products, including services, food, music, books, household products, airline tickets, and even investments that can be made in the marketplace. Google Lighthouse is a complex metric where the assessment includes in terms of Performance, Accessibility, Best Practices, and SEO, which is presented with a score of 0 to 100 in other words, Google will assess a website with a predetermined metric and then audit it to improve accessibility and SEO. a website. The results of this study are expected to be able to present actual analytical information based on the matrix determined by Google Lighthouse for future improvements where the Tokopedia marketplace gets a performance value with a yellow score of 85, which can be optimized by minimizing the speed index 3.7s, time to interactive 5.9s and total blocking time is 390s to be more optimal in terms of performance and Shopee has decreased in performance with a value of 13 red on first contently paint 2.8s, speed index 16.8s, time to interactive 26.5s, largest contently paint 16.3s, cumulative layout shift 0.484 and total blocking time of 1,710ms to be further assessed for optimal results. Based on this test, it can be concluded that Tokopedia is superior to Shopee from various aspects of the matrix tested.

Keywords: *Marketplace, Google Lighthouse, Analysis, Website Performance.*

1. Introduction

Today the development of information technology is increasing rapidly with the existence of a website which has become a familiar need for the social community. The website has also been so developed by presenting various needs ranging from the distribution of actual sharp, reliable information, online-based public services, and goods and services or what is often known as the marketplace [1] [2] [3] [4]. The growth of the marketplace has been very rapid lately, not only online buying and selling activities, but it has also penetrated almost all products, including services, food, music, books, household products, airline tickets, and online investment. Marketplace provides an effortless meeting of providers of goods or services with buyers, where buyers can immediately see what products or services are being sold or provided. Then the marketplace can take advantage of both the advertising of goods or services from the provider and sharing the proceeds or commissions from each sale. The marketplace also ensures optimal and safe management operations [5] [6].

Of all the well-known marketplace platforms in Indonesia, Tokopedia and Shopee are one of the best. According to research by iPrice Shopee, it became the most popular e-commerce application on the App Store and Google Play Store last year. Meanwhile, Tokopedia excels in terms of website visits. iPrice released research on shifts in the Indonesian e-commerce industry over the past year. iPrice ranks the ten largest e-commerce sites in the country based on two categories, namely app popularity and website visit rates. Data related to popular online shopping applications are taken from Data.ai. This refers to the app's popularity in the App Store and Google Play Store. As a result, "Shopee managed to maintain its position as the most popular e-commerce application on the App Store and Google Play Store throughout 2021". Therefore, it is essential to have an optimal and responsive marketplace in terms of delivery, store ratings, and online store response rates to provide a more optimal shopping experience to advance the life of a civilized society [7] [8] [9].

2. Literature Review

2.1. Website

A website is a collection of web pages contained in a domain or subdomain located on the World Wide Web (WWW) on the internet. The reason someone visits a website is because of the content available on that website. Examples of websites are Google.com and Facebook.com. Dissemination of information through the website is very speedy, covers a wide area, and is not limited by distance and time. Therefore, the website is an essential means of obtaining and managing information.

Even according to experts, a website is an information page provided via the internet so that it can be accessed all over the world as long as it is connected to the internet network. A website is a component or collection of components consisting of text, images, sound, and animation so that it is interesting to visit [10].

2.2. Marketplace

The marketplace is a familiar term for those who are used to buying and selling online. The meaning of marketplace is often equated with online stores. So what is a marketplace? Quoted from the Shopery page, a marketplace is a platform where sellers gather and can sell goods or services to customers even without meeting physically. The marketplace company is to provide a platform where sellers and buyers meet, where buyers can see what products are being sold, then the marketplace company takes profits through commissions from each sale. Platforms in the marketplace can be in the form of websites or applications. All marketplace operations, including website management to payment methods, are facilitated by marketplace provider companies.

The concept of a marketplace is more or less the same as a traditional market. Where the owner of the marketplace is not responsible for the goods sold. This is because the job of a marketplace company is to only provide a place for sellers who want to sell and customers looking for products with easy and fast transactions. If the buyer is interested in buying, the transaction will be regulated by the marketplace, starting from payment until the delivery of the goods to the consumer.

That way, the marketplace is a solution created from the rapid development of information technology and the internet that is attacking the trading industry. In this marketplace, every business actor can display their products for sale without the hassle of building a system. The marketplace is very beneficial for business actors and petite and medium enterprises. The marketplace makes it easier for small and medium business actors to carry out operations. With the virtual market, business actors only need to provide complete information about the products they sell in the marketplace, such as product information, prices, delivery, and others [11] [12] [13].

2.3. Tokopedia

PT Tokopedia is an electronic trading company or often called an online shop. Since its founding in 2009, Tokopedia has transformed into a unicorn that is influential not only in Indonesia but also in Southeast Asia. Until now, Tokopedia is one of the most visited marketplaces by the Indonesian people.

Tokopedia also supports Micro, Small, and Medium Enterprises (MSMEs) and individuals to develop their businesses by marketing their products online with the Government and other parties. One of the collaborative programs initiated by Tokopedia is the annual MAKER FEST event which has been held since March 2018 [14] [15].

2.4. Shopee

Shopee is a commercial electronic website headquartered in Singapore and owned by Sea Limited (formerly known as Garena), founded in 2009 by Forrest Li. Shopee was first launched in Singapore in 2015 and has since expanded its reach to Malaysia, Thailand, Taiwan, Indonesia, Vietnam, and the Philippines. Starting in 2019, Shopee has also been active in Brazil, making it the first country in South America and outside of Asia that Shopee visited.

In 2015, Shopee was first launched in Singapore. Shopee first launched as a consumer-to-consumer-to-consumer place. But now they have switched to a hybrid C2C and business-to-business-to-consumer since launching Shopee Mall, an online store platform for well-known brands. In Indonesia, a survey conducted in December 2017 by The Asian Parent revealed that Shopee is the first choice shopping platform for mothers in Indonesia (73%) [14].

2.5. Google Lighthouse

Lighthouse is an open-source automated tool for improving the quality of web pages. Lighthouse is a measurement and auditing tool for website quality performance, accessibility, progressive web applications, and more. Google introduced an SEO tool in mid-2018 called Lighthouse, which provides the best way to improve the overall performance and quality of your pages. As a fully automated tool, Google Lighthouse checks for accessibility and performance [16].

Initially, Lighthouse was created to review Progressive Web Apps (PWA). The tool executes four reviews for Progressive Web Apps, accessibility, performance, and a comprehensive list of best practices. These days, Google even includes an SEO check. These tools provide you with very sophisticated results or diagrams of the value and execution of your website. Site speed has a direct correlation with client experience and recognition. If your site still feels slow, speed in numbers means nothing. Many clients around the world are on 3G networks that have poor or lower speeds [17].

Besides, even with a blazing-fast 4G network, a site can be inherently slow too. During the testing process, Lighthouse provided a simulation of browsing your mobile website on a slightly powerful gadget to go through a weak 3G connection. When the test is complete, it will generate a report with actionable tips to apply with a score representing your current performance. With over 5.2 billion searches a day, Google is by far the most popular search engine. So, seeing how it views and measures your website is very useful [18] [19].

2.6. Metrix Google Lighthouse

Performance is about measuring how fast a browser can compose web pages. Lighthouse uses a web browser called Chromium to render the page and run tests on it as it is created. This tool is open-source (meaning it is managed by the community and free to use). As seen there, there are four metrics, namely: Performance, Accessibility, Best Practices, and SEO [20] [21] [22].

3. Method

Before conducting the research, the research steps applied can be seen in Figure 1 below:
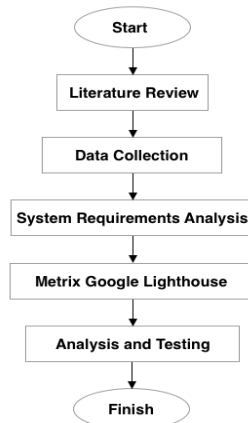
Fig. 1: Research Flowchart

It can be understood that this research starts from the study of literature or literature from various sources, such as information related to research that will be carried out both from articles and journals to support this research.

Data collection is done by inputting the website to be examined on Google and checking several metrics applied to Google Lighthouse. All of these metrics range from 0-100. A score of 0-49 is wrong, 50-89 is sufficient, and 90-100 is the best. After performing an audit of the designated marketplace web page, Lighthouse will generate reports on five different areas

1. Performance includes elements that slow down the marketplace page, including images and resources.
2. Accessibility audits how easily accessible content on the marketplace is for users, including the use of assistive technology
3. Best practice identifies web development elements that do not follow current guidelines and best practices.
4. SEO highlights the problem of SEO itself with webpages that are not comprehensive.

It consists of several audits for performance, accessibility, progressive web applications, SEO, and more and can be run against any web page regardless of whether it is hosted on your server or a public service like Google page or GitHub. Each audit contains a reference document explaining why the audit is essential and how to improve it. Lighthouse can be run as a web app from the GitHub repository, but it also has a Chrome extension to run on any website. It is used by many front-end developers to analyze various front-end performance metrics of web applications. Lighthouse is available in different workflows that are easy to use and are an essential tool for webmasters who are concerned about website speed.

The stages of analysis and testing are carried out to find reports from each audited marketplace, in this case, Tokopedia and Shopee. This process includes the run-test steps carried out on the https://web.dev/measure/ page.

4. Result and Discussion

Based on the data collection that was obtained on July 4, 2022, the analysis and testing are continued with the scan results that have been obtained using Google Lighthouse data obtained:
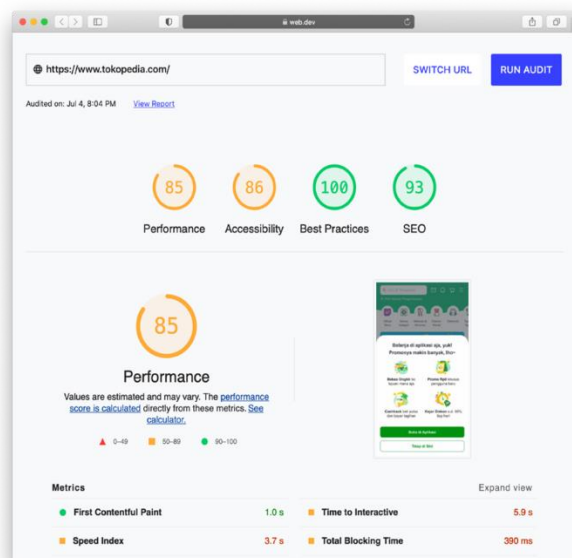
Fig. 2: Tokopedia Audit Results

From the results of the Run-audit conducted on the Tokopedia marketplace, it can be seen that the performance got a yellow value of 85, which can be optimized again by minimizing the Speed Index of 3.7s, Time to Interactive 5.9s and Total Blocking Time 390s to be more optimal in terms of performance. Accessibility is at a yellow value of 86 by optimizing the three-line element in the right corner of the menu that does not have a name, this can confuse users because there is no text, it easier for users to read menu functions. Best Practices shows a value of 100 green because it has relied on the latest technology, including the use of Hypertext Transfer Protocol Secure or often known as https. SEO shows a green value of 93 where Tokopedia has passed the check and ensures that the page has followed basic search engine optimization suggestions such as having a <meta name="viewport">tag with widthorinitial-scale and having an <title> element.
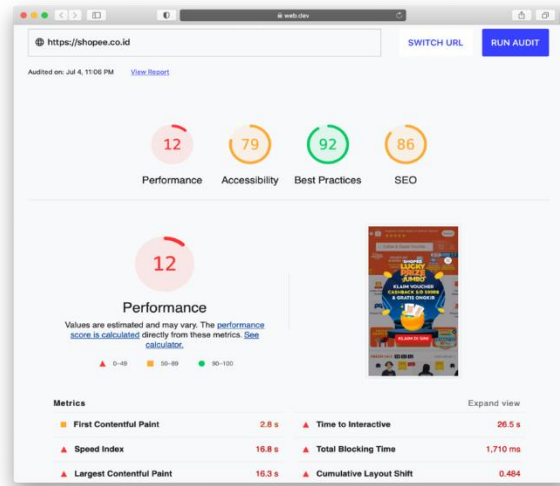

Fig. 3: Shopee Audit Results

Meanwhile, the Shopee marketplace experienced a decrease in performance, rated as 13 red, where five basic things must be improved so that the marketplace performance is more optimal. The basic things that need to be considered are minimizing First Contentful Paint 2.8s, Speed Index 16.8s, Time to Interactive 26.5s, Largest Contentful Paint 16.3s, Cumulative Layout Shift 0.484 and Total Blocking Time 1.710ms to be more optimal in terms of performance. Accessibility is rated 79 yellow which can be optimized to improve Image elements do not have [alt] attributes, one of which is div.simple-banner > a > img.banner-image. The Best Practices section got 92 good green results, but it also got re-optimized in the deprecated APIs section that had to be removed and Missing source maps for large first-party JavaScript. The last part of SEO shows a yellow value of 86 where testing is also carried out in the search engine optimization advice category where there are errors that must be fixed in robots.txt line 32 Disallow: ?sp_atk= Pattern should either be empty, start with "/" or "*" and line 33 Disallow: __classic__=1 Pattern should either be empty, start with "/" or "*".

From the results of the comparative analysis of the two marketplaces Tokopedia and Shopee in this study, it can be explained in Table 1:

Table 1: Google Lighthouse Marketplace Metrix Analysis Results

	Metrix	Tokopedia	Shopee
1.	Performance	85	12
2.	Accessibility	86	79
3.	Best Practices	100	92
4.	SEO	93	86

5. Conclusion

Based on the results of the analysis and testing conducted in this research using Google Lighthouse on the Tokopedia and Shopee marketplaces with testing based on four Metrix elements, namely Performance, Accessibility, Best Practices, and SEO, it can be concluded that Tokopedia is superior to Shopee from various aspects of the metrics tested. Tokopedia has done a lot of optimization improvisations than Shopee, and these results will significantly affect the performance of the operating marketplace. There are still many things that must be optimized in the Shopee marketplace, especially in the performance section, which must be improved as quickly as possible to get better results and performance than before.

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