Websites Optimization Metrics: A Systematic Literature Review

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Abstract:

This paper presents a systematic literature review SLR to get an overview about the current studies of distinct criteria for performance evaluating the websites and each criteria is explored briefly to give the basic idea behind it. In general, the paper's objective is to give an up-to-date introduction and short review of these criteria . A Systematic literature review is implemented according to the guidelines of performing a SLR in software engineering. The study was based on a comprehensive set of papers gathered from the online libraries published within time span 2010 to 2022 . The results from this SLR include information about the criteria for evaluating the performance of the multi-level web according to previous research, which was divided into applicable sub-criteria, and then the latter was divided into measurable indicators. within a specific period that can help researchers in this field through providing an overview of the current researches in this area. Furthermore, it may serve as a first step towards a great explanation of the topic with the help of SLR.

Keywords: Websites Performance Evaluation, Performance Metrics, Performance Indicators

1. Introduction:

A large number of new websites have been created every day. The websites which have same contents will not have the same performance degree. If the website has poor performance, this make the user leave the website simply and go elsewhere, and there is no chance to get user back to the website once again. Therefore, in order to improve the website performance, it is important to create the website with some properties such as: gainful, useable, available, useful and give reliable information that providing a good design and graphical form to meet the requirements and expectations of the users. This can be done through defining the website criteria, the quality of website depends on some measurable metrics that providing an effective to develop the performance of the website. However, the performance evaluation process became a challenge of the new websites.

Generally, the performance evaluation process of website became an essentially valuable topic and continuously in development , especially in the field of websites quality metrics (Liburne et al., 2004). Several metrics have been developed for measuring the performance of websites, which include largest contently pain, first input delay, cumulative layout shift, page loading speed, first contently paint, speed index, total blocking time, on load time and fully loaded time as shown in table 1.

Table 1 Website Performance Indicators Overview

Level One (Metrics)	Second Level (Indicators)	Third level (Sub-Indicators)
Web Key Performance Indicators (KPIs)	Largest contently Pain (LCP)	Image
		Attributes of Multimedia
		Standard Table Size
	First Input Delay (FID)	Image Size
		Multimedia
		JavaScript
	Cumulative Layout Shift (CLS)	Image definition
		Multimedia definition
		Font Size and Format
	Page Loading Speed (PLS)	Image
		Attributes of Multimedia
		Standard Table Size
Web Secondary performance indicators (SPIs)	First Contently Paint (FCP)	Page Size in Bytes (PSIB)
		Time to First Byte (TTFB)
	Speed Index (SI)	Download speed
		Number of Page Elements
	Total Blocking Time (TBT)	Blocking Time
		Number of Ads
	On load Time (OLT)	Download speed
		Front Page Elements
	Fully Loaded Time (FLT)	Download speed
		Last Page Elements
	Largest Input Delay	First Meaningful Paint (FMP)

These metrics have been divided into several applicable sub-metrics and then the latter is divided into measurable indicators, where these indicators have obtained high percentages that make them usable in design the website.

This paper provides a systematic literature review to present a broad overview of the primary studies on evaluating the performance of websites since 2010. The motivation is the identification of the evidence available on the topic and identification of the research gap in evaluating the performance

indicators. Following the introduction, the structure of this paper is as follows: section 2 includes the systematic literature review framework, section 3 contains the discussion of the research questions that explain the website performance indicators, and the evaluation calculation, while the conclusions presented in section 4.

2. Systematic Literature Review Framework:

The process of selecting and categorizing research from as much current literature as is relevant to an interest issue is known as a systematic literature review. When applied to a particular topic, it frequently produced a summary and a map of its findings by categorizing various research report types according to numerous dimensions. These investigations have primarily been suggested for research fields with very broad topics and little relevant information discovered during primary domain studies. When doing a coarse-grained review, the only goals are to locate and identify relevant evidence for research questions and to spot any knowledge gaps that can inform future study. In this study, a systematic mapping study of website performance indicators have been conducted, since it seems to be a broad topic with various researches focus fields. However, no existing research has conducted a systematic literature review of this area. This section characterizes the review protocol that include the fundamental process of defining the research questions, defining the strategy of search, selecting of previous studies, and systematic map.

2.1 Research Questions

The goal of this study is to get a presentation and an overview of the current researches in the area of performance website evaluation indicators by the following questions. The overall goal is defined in these research questions:

RQ. 1 What are the different metrics used in evaluation the performance of websites?

RQ. 2 Which is the most widely used metric that affect the performance?

RQ. 3 What are the website performance indicators?

RQ. 4 How to improve the website performance?

2.2 Select Primary Studies

This paper presents a systematic review of the work done in the field of website performance indicators and in order to get a broad view, various papers and journals have been searched and selected the publications that related to this study within the time span 2010 to 2022. After selecting the publications related to the study within this period, 34 articles have been found that very closely to the website performance indicators.

The search strings that table 2 are found among academic databases to locate articles having these strings in their abstracts, titles, and keywords. Accordingly, famous online academic databases like ACM, IEEE, Science Direct, Springer, Google Scholar, Taylor and Francis, and Wiley are used.

3. Discussion of the Research Questions:

This section discusses the answers from the researches that described the research questions.

3.1 Research question 1: What are the different metrics used in evaluation the performance of websites?

The indicators of evaluating the performance of website were presented in table 1, these indicators were collected after a comprehensive study of the previous researches stated in table 2, that presents a group of previous research specialized in evaluating the performance of websites within the period from 2010 to 2022 where the metrics used in each research were determined.

Table 2 Website performance Indicators Based on the Previous Researches

S	Researchers	LCP	FID	CLC	PLS	SI	FCP	TBT
1	Xilogianni et al. (2022)	✓	✓	✓	✓	✓	✓	✓
2	Alsmadi et al. (2014)	✓	✓	✓	✗	✗	✗	✗
3	Bhamidipati and Hellberg (2022)	✓	✓	✓	✓	✗	✗	✗
4	Granqvist (2022)	✓	✓	✓	✗	✗	✗	✗
5	Mosca and Perini (2022)	✓	✓	✓	✗	✗	✗	✗
6	Kwangsawad et al. (2019)	✓	✓	✗	✓	✗	✗	✗
7	Welling and White (2006)	✓	✓	✓	✗	✗	✗	✗
8	Asrese et al. (2019)	✓	✓	✗	✗	✗	✓	✗

9	Hasnain (2020)	✓	✓	✓	✓	✓	✗	✗
10	Kinnunen (2020)	✓	✓	✓	✓	✓	✓	✓
11	López et al. (2019)	✗	✓	✗	✗	✗	✗	✗
12	Shiller et al. (2018)	✗	✗	✗	✗	✗	✗	✓
13	Hannu (2018)	✓	✓	✓	✗	✗	✗	✗
14	Makki (2017)	✓	✓	✓	✓	✗	✗	✗
15	Swallow (2017)	✓	✓	✗	✗	✗	✗	✗
16	Sychrová and Šimberová (2016)	✓	✓	✓	✗	✗	✗	✗
17	Devi and Sharma (2017)	✓	✗	✓	✓	✓	✓	✗
18	Zahran (2016)	✓	✓	✓	✓	✗	✗	✗
19	Bartuskova and Krejcar (2015)	✓	✓	✓	✗	✓	✓	✓
20	Bartuskova et al. (2016)	✓	✓	✓	✓	✓	✓	✓
21	Zia (2015)	✓	✓	✓	✗	✗	✗	✗
22	Alserr (2014)	✓	✓	✗	✗	✗	✗	✗
23	Munyaradzi et al. (2016)	✓	✗	✗	✗	✗	✓	✗
24	Hoßfeld et al. (2012)	✓	✗	✗	✗	✓	✓	✗
25	Tyagi et al. (2012)	✓	✓	✓	✓	✗	✗	✗
26	Soininen (2011)	✓	✓	✓	✗	✗	✗	✗
27	Shoaib and Das (2011)	✓	✓	✓	✓	✓	✗	✗
28	Jensen (2008)	✓	✓	✓	✓	✗	✗	✗
29	Muhammad et al. (2010)	✓	✗	✓	✓	✓	✓	✗
30	Al-Azza (2010)	✓	✗	✗	✓	✓	✗	✗
Number of researches used for metrics		28	24	21	15	10	9	5

The Utilization weight of the previous studies has been is calculated for each criterion, based on the percentages gained by the evaluation indicator from prior studies. The number of studies for each indicator and the percentages of these criteria are displayed in table 3.

Table 3 Indicators and References

Indicators	References	Utilization rate*
LCP	(1-10, 13-30)	93.33%
FID	(1-11, 13-16, 18-22, 25-28)	80%
CLS	(1-5, 7, 9, 10, 13, 14, 16-21, 25-29)	70%
PLS	(1, 3, 6, 9, 10, 13, 14, 17, 18, 20, 25, 27-30)	50%
SI	(1, 9, 10, 17, 19, 20, 24, 25, 27, 29, 30)	33.33%
FCP	(1, 8, 10, 17, 19, 20, 23, 24, 29)	30%
TBT	(1, 10, 12, 19, 20)	16.67%

$$*\left(\frac{100}{Total\ researches}\right) \times Sum\ of\ researches\ used\ for\ indicator$$

These indicators could be characterized as follows:

— LCP: The LCP represents the loading time of a website. It measures how fast the web page shows its largest content on the screen, including images, videos, or blocks of text (Kinnunen, 2020). This criterion's degree of evaluation is estimated at (25%) as shown in table 3, and it is one of the key components of the evaluation process because it obtained an estimated use rate of (93.33%) as shown in table 3 that shows the relative percentages of each metric depending on the previous studies.

— FID: The FID measures how quickly a user can respond to their first interaction with a website (López et al., 2019). This raises the website's value and results in an estimated usage rate of (80%) among users as shown in table 3.

— CLS: CLS measures how much a webpage changes unexpectedly while a page is loading. It's an important metric for measuring visual stability (Kinnunen, 2020). And it has an estimated usage rate of (70%) as shown in table 3.

— PLS: The PLS is one of the most important secondary metrics for evaluating website performance. It is measured by bytes (Munyaradzi et al, 2016). The evaluation score for this standard is 13%, in addition, it has achieved an estimated usage rate of (50%) as shown in table (3).

— SI: The SI measurement is based on the page load time and the number of pages or elements of a website. It is measured by milliseconds, and for good user experience (Hoßfeld et al., 2018). which has an estimated evaluation degree of (9%). And it now has a predicted utilization rate of (33.33%) of the previous works as shown in table 3.

— FCP: Measures the time the first piece of content appears (Xilogianni et al., 2022). And it now has a predicted utilization rate of (30%) as shown in table (3).

— TBT: Measures the blocking period of the website caused by the advertisement in other words (FCP and

TTI) measures the total duration of between JavaScript tasks (Shiller et al., 2018). And it now has a predicted utilization rate of (16.67%) as shown in table 3.

The appropriate weight for each quality criterion is determined through the usage indicator for each criterion by previous research shown in table 3, where it is represented by a percentage indicating its importance as shown in figure 1.
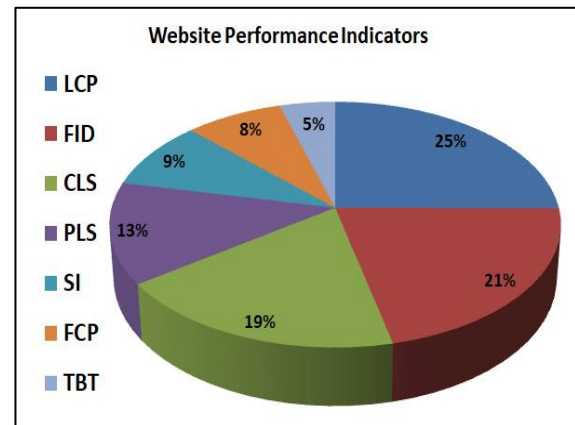

Fig. 1 Website performance indicators percentages based on previous studies

3.2 Research question 2: Which is the most widely used metric that affect the performance?

In this study, earlier research's on evaluating the effectiveness and quality of websites was studied in order to identify the most popular metrics that listed in table 1. These researches were selected from journals and theses. Table 3 shows that (LCP, FID, CLS, PLS, SI, FCP, and TBT) received the greatest percentages of the previous works, demonstrating the significance of its use. The systematic map of the quality metrics is illustrated using summary statistics which showing the frequencies of publications in each category. In this study a bubble plot has been used to report the frequencies shown in figure 2, each bubble contains the number of researches that have been focused on in different years within the period 2010 to 2022. The bubble plot is more powerful in giving a quick overview of a field, and thus to provide a map. From the figure 3, it seems that the performance criterion metric that influence quality, such as structure, have been employed most frequently.
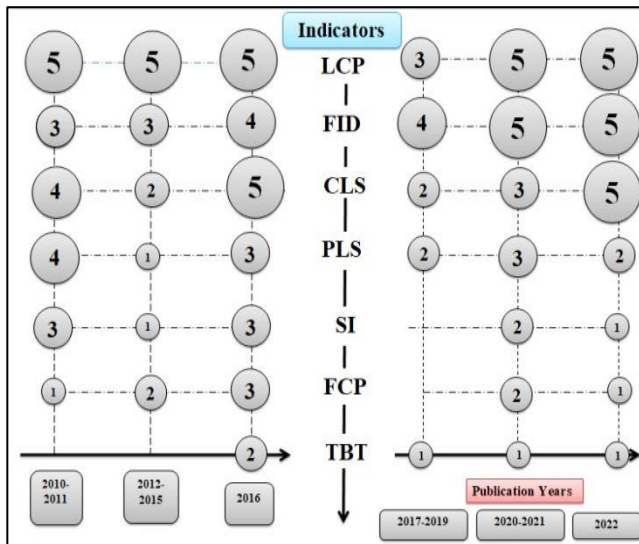
Fig. 2 Visualization of systematic map of web evaluation criteria in the form of a bubble plot based on the publication years

Fig. 3 The performance website indicators types

3.3 Research question 3: What are the website performance indicators?

This chapter focuses on website performance indicators which are important elements for evaluating the performance of websites. The chapter also explains the factors that affect the performance indicators. Whereas, these metrics are divided into primary and secondary indicators as representing quantifiable indicators. Different websites performance assessment tools will be explained in order to select the assessment tool that is used for comparison with the proposed tool which has been designed in this thesis for evaluating the performance of websites.

3.3.1 Web performance indicators

Website performance indicators are the basic components that affect the quality of any website. These indicators need to be evaluated to check the website's quality and effectiveness. These indicators are divided into key performance indicators (KPIs) that contribute effectively to calculating the performance evaluation of websites, and secondary performance indicators (SPIs) that measure other aspects that will be explained in this chapter, figure 3 presents these indicators.
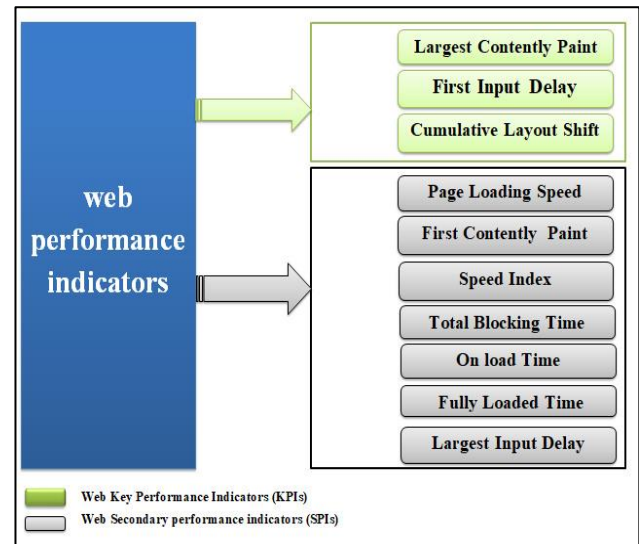
a) Web key performance indicators (KPIs)

The KPIs have been introduced as one of the factors affecting search engines. Although these indicators change continuously, they focus on three parts of the webpage which are largest contently paint (LCP), first input delay (FID), and cumulative layout shift (CLS). Studies show that improved KPIs could evolve user interaction with the website. For example, researches have shown that the probability of users stopping loading a webpage is less by (24%) if a website meets KPIs thresholds. Researcher improved web KPIs and noticed that the advertising income has increased by (18%) as well as the webpage views by (27%) (Kinnunen, 2020).

Core web vitals refers to a set of metrics announced by Google in early 2020 that will affect its overall search operation. Core web vitals will become an important part of the results of the website user experiment and the website rating will depend on the good user experience. Where, the loading, interactivity, and visual stability are among the most important metrics of user experience that affect the rating of the website. These indicators will be explained in details in the next sections.

— Largest Contently Paint (LCP)

The LCP represents the loading time of a website. It measures how fast the web page shows its largest content on the screen, including images, videos, or blocks of text. This element has

great importance to preserve good performance and then increase website users because the time required to display the largest content is the main indicator of how can download the page fully. The LCP score is measured by seconds and a web page should have LCP of 2.5 sec. or less in order to get a good user experience. When the LCP score is greater than 4 sec., this means that the website performance is poor and this effects negatively on user experience and prevents the growth of the website, while LCP score of higher than 2.5 and less than 4 sec. is acceptable, but it can be improved by modifying some elements (Kinnunen, 2020). Figure 4 shows the LCP scores, including the time needed for each score: (good, needs improvement, and poor).
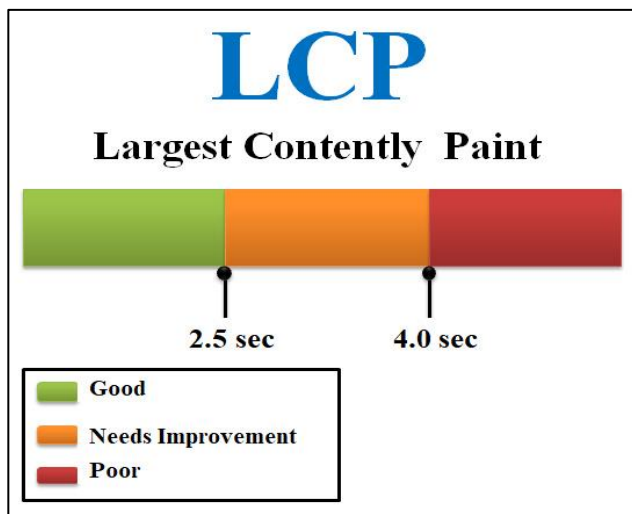
Fig. 4 Largest contently paint scores

‒   First Input Delay (FID)

The FID measures how quickly a user can respond to their first interaction with a website. It's a significant measure of a website's loading speed. It represents the amount of time that it takes between a user's first interaction with a website and the time the browser responds to that interaction. This indicator is measured by milliseconds, the time allowed for the first interaction should not exceed 500 milliseconds for providing a good user experience (López et al., 2019). This indicator is important because it's affecting on the number of website users. Figure 5 presents the FID scores with the time of each score which are: (good, needs improvement, and poor).
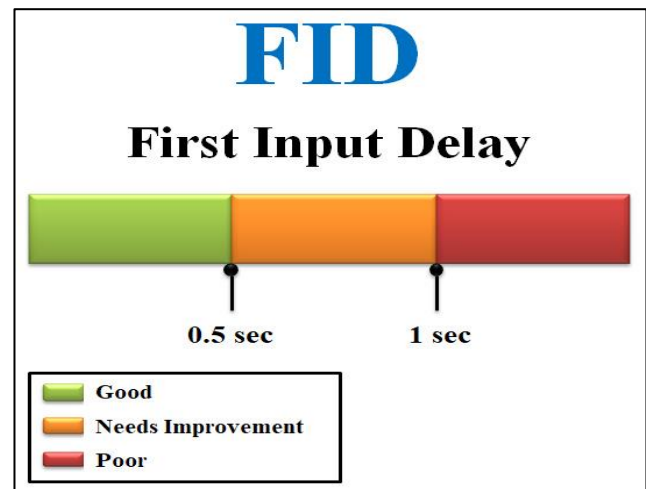

Fig. 5 First input delay scores

‒   Cumulative Layout Shift (CLS)

CLS measures how much a webpage changes unexpectedly while a page is loading. It's an important metric for measuring visual stability. For example, if the users of a website loaded a page and while they were reading it, the banner loads and the page shifts down, that would increase the CLS score. For a good user experience, a score of CLS of less than (0.1) should be kept. This element means exactly the percentage of the design change on the page during the loading and the result is measured between (0-1), where the number (1) indicates the maximum value of the changes which means that there is a significant change, while the number (0) indicates that there is no change in the page layout (Kinnunen, 2020). Figure 6 shows the CLS grades which are: (good, needs improvement, and poor).
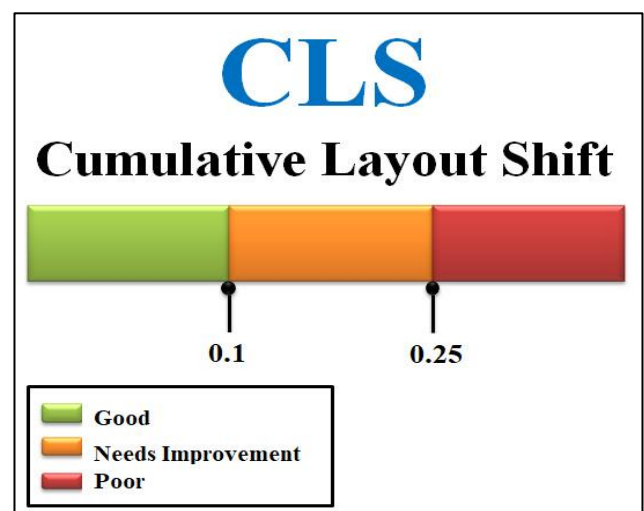

Fig. 6. Cumulative layout shift scores

b) Web secondary performance indicators (SPIs)

In addition to the main indicators of web performance that have been explained previously which are (LCP, FID, and CLS), there are secondary indicators that should be stated, which are largest input delay (LID), speed index (SI), page loading speed (PLS), on load time (OLT), and fully loaded time (FLT), these indicators will be explained in the next sections.

— Page Loading Speed (PLS)

The PLS is one of the most important secondary metrics for evaluating website performance. It is measured by bytes (Munyaradzi et al., 2016), and figure 7 shows this indicator and its three scores, including the speed for each score which are: (good, needs improvement, and poor).
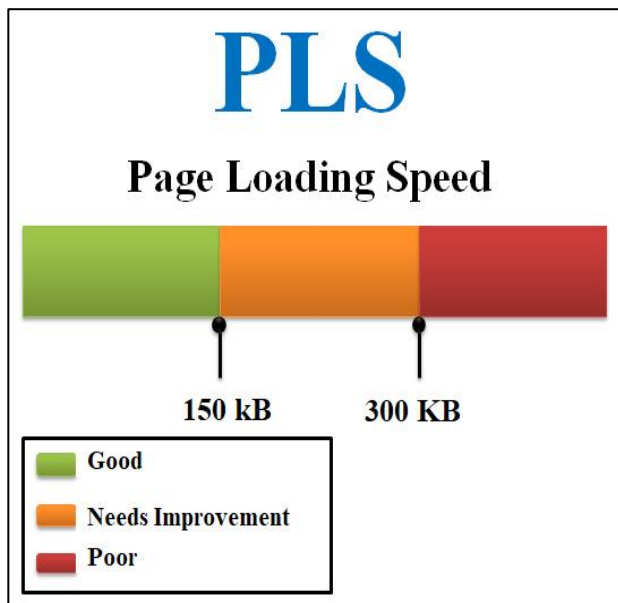

Fig. 7. Page loading speed indicator

— Largest Input Delay (LID)

LID is the largest delay time for the website to respond to user requests. Figure 8 shows the largest input delay component and its three scores, including the time for each score: (good, needs improvement, and poor). It is measured by seconds, and for good user experience, the LID should be less than 3 sec (López et al., 2020).
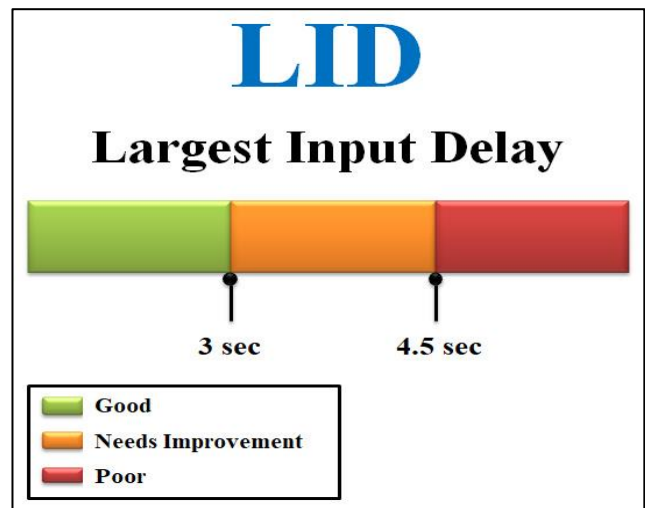

Fig. 8. Largest input delay indicator

— Speed Index (SI)

The SI measurement is based on the page load time and the number of pages or elements of a website. It is measured by milliseconds, and for good user experience, the SI should be less than 0.01 sec. Figure 9 shows the speed index element and its three grades, including the time for each grade: (good, needs improvement, and poor), (Hoßfeld et al., 2018).
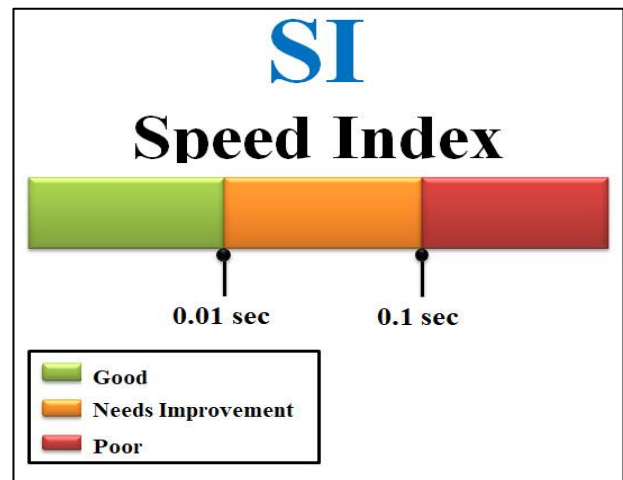

Fig. 9. Speed index indicator

— Total Blocking Time (TBT)

Measures the blocking period of the website caused by the advertisement in other words (FCP and TTI) measures the total duration of between JavaScript tasks (Shiller et al., 2018). Figure 10 shows the Total blocking time element and its three grades, including the time for each grade: (good, needs improvement, and poor).
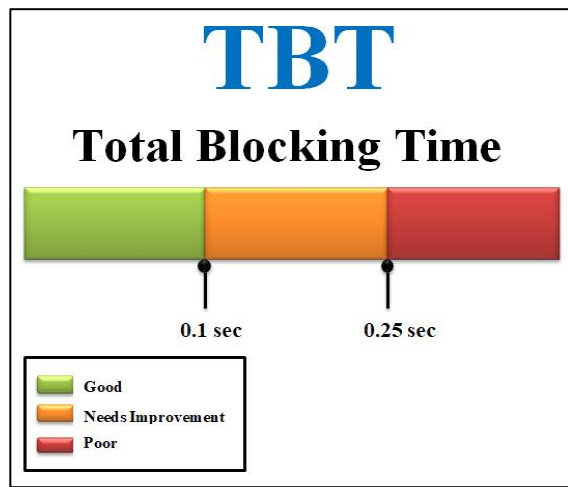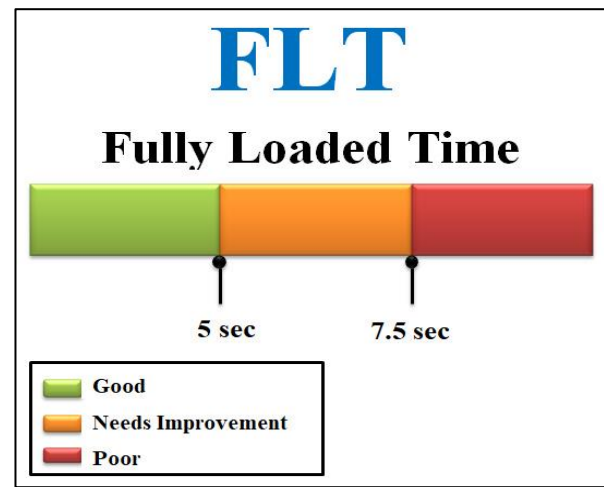
Fig. 10. Total blocking time

— On load Time (OLT)

OLT is the time of loading the home page of a website. The root page usually gets the highest weight from the rest of the website pages. Figure 11 shows the loading time element and its three degrees, including the time for each degree: (good, needs improvement, and poor), (Xilogianni et al., 2022).
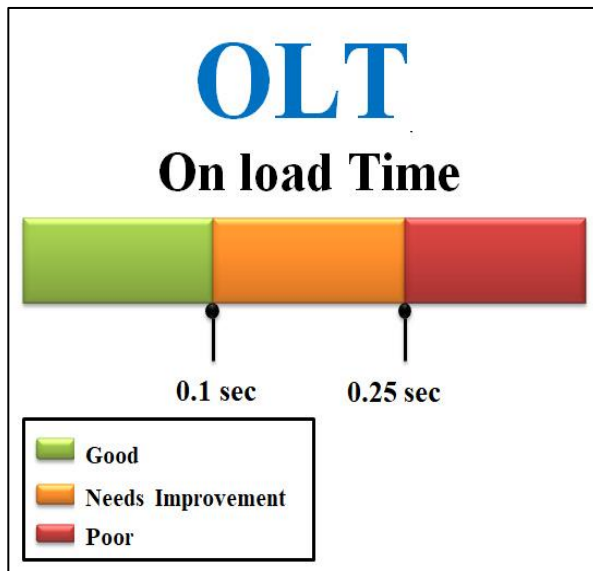

Fig. 11. On load time indicator

— Fully Loaded Time (FLT)

FLT is the total time of loading the last page of the website. Figure 12 presents the element of the full loading time and its three degrees, including the time for each degree: (good, needs improvement, and poor), (Xilogianni et al., 2022).

Fig. 12. Full load time indicator

— First Contently Paint (FCP)

Measures the time the first piece of content appears, figure 13 presents the element of the first contently paint and its three degrees, including the time for each degree: (good, needs improvement, and poor), (Xilogianni et al., 2022).
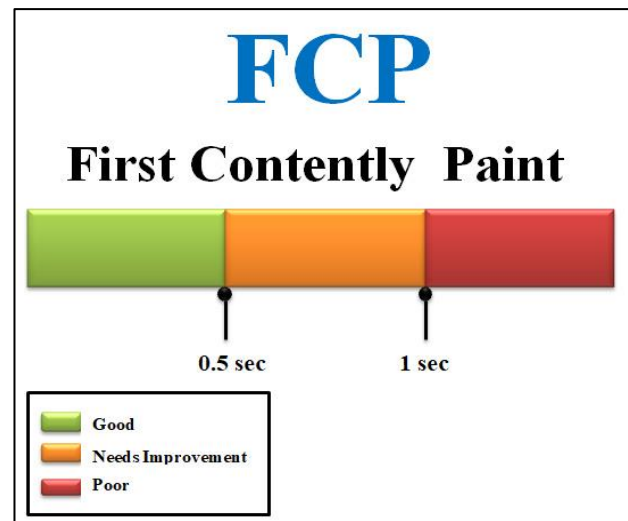

Fig. 13. First contently paint

3.4 Research question 4: How to improve the website performance?

According to a study (Kinnunen, 2020), with every 100 ms decrease in LCP, the conversion rate on farfetch.com (A popular affection website) increases by (1.3%). LCP is affected by some elements that are larger than the content of the page, and the largest element usually can be any of the following: (image, background image, video or animation, view level

element, etc.). So this research is focused on measuring and improving those elements that affect LCP's indicator, as shown in table 4 and table 1 explains these elements in addition to the proposed improvement aspects of each element, which ultimately leads to improving the performance of websites.

Table 4 LCP Indicators and improvement suggestions

Indications Affecting LCP	Description	Suggested Improvement Aspects
Image definition	Images are one of the most used elements on websites, as a result they affect performance.	— Image dimensions must be specified — Convert jpg files to webp — Image size must be provided.
Large Image on page	Using an excessive number of images in websites increases average page sizes, which reduces performance by slowing down page load times.	— Modern fonts and CSS3 code should be used in place of plain pictures and gradients. — Save images in JPG format for the web with a quality between 75-85%
Image Alternative Text (Image ALT)	Since some website visitors prefer to read the alt text rather than the image itself, this attribute will set the text for each user to read.	— Each image be encoded in the image's ALT attribute. — Use a collage of all site images as much as possible using CSS Sprites technology .
Image Link	The site has more hyperlinks, including those associated with images. This affects the loading speed and response of the site.	— Selecting images with the image link attribute is required.
Attributes of Multimedia	The page load time shouldn't be impacted by the video. Since this process can be difficult, so, some operations could be followed to make sure that embedding videos don't	— Choose the present download time. — Choose how you want to embed your videos — Consider the

	affect the loading time, and finally, don't even slow down the page.	unique needs of company — The level of quality directly affects results .
one media in one page	The loading time increases when there are more multimedia elements on a page.	— A web page should have only one multimedia element.
Using Thumbnails	A small image that serves as a preview on a web page and usually includes a link to a larger version of the image or multimedia item. This study found that using thumbnails can reduce the time it takes to load pages.	— The "title" and "alt" properties, as well as a maximum size of (240 x 240) pixels, must be present on each thumbnail image.
Standard Table Size	Although many websites still define table width as pixels. However, some sites have a settable width at a high rate, where the table must be compatible with any size of browsers, regardless of screen resolution.	— The width attribute must specify a fixed number in the table code
Page Resolution	Page resolution has a big impact on loading speed .	— The resolution of a page should be higher than 1024 x 768.

FID is affected by some elements and it differs from one element to another within the page, therefore, an improvement must be made on these elements to obtain the lowest page response time, table 5 represents the elements affecting FID, and table 1 defines these elements in addition to the proposed improvement aspects of each element, which ultimately leads to improving the performance of websites.

Table 5 FID Indicators and improvement suggestions

Indications Affecting FID	Description	Suggested Improvement Aspects
Pictures of the right size	Large images must be resized to make them smaller. The "drag to resize" feature cannot be	— On the admin website, locate the large images. Resize to the

	used in the visual editor as this only resizes the displayed image (not the actual image).	appropriate size. — Make a sheet with information on the size of the site, the sidebar, the featured images, etc. — Before uploading photographs, crop and resize them (e.g. Photoshop or GIMP).
Video Slip	As long as they are web-optimized and don't cause the site to load slowly, videos can improve the search engine of the website.	— Choose how to embed your videos — Consider the unique needs of company — The level of quality directly affects the results .
Animation	Animations have an impact on response time, thus they should be used in a way that encourages users to respond to the site quickly. Web animations can be used to draw attention, improve user engagement, and communicate more effectively.	— Check the CPU load and site load times. — Explore other alternatives — Observe usability
Electronic advertising	A digital form of communication is used by organizations that want to make money by offering products and services to their customers. Its use slows down website response time . It is divided into video ads, pop-up ads, inline ads, static banners, animated banners, and bar ads.	— Total blocking time should be decreased, and the size of the advertisements on the webpage should be restricted.
(GIM tool) Gender Impact Assessment	A tool describes Tag Manager that is used to manage JavaScript and HTML Tags on web	— With GIM, you can easily add and remove code snippets without

and Monitoring	pages. These HTML and JavaScript tags are used for tracking and analytics.	having to get your hands dirty with code. Google Launched it in the year 2012, and it is available for free.
JavaScript content	Removing unused JavaScript can improve several things like JavaScript execution time and Huge network loads (FID and TBT).	— Remove unused JavaScript in wordpress is the preferred (Content Management System (CMS)) . — Use the extension to disable unused JS/CSS from page builders — Activate "Improved Asset Loading" in the element or experiment settings

CLS is an important web performance metric, that is affected by some elements illustrated in table 6. This importance results from its association with the reliability and validity of the website, so these elements must be identified and improved. Table 1 defines the elements affecting the CLS in addition to the proposed improvement aspects for each element, which ultimately leads to improving the performance of websites.

Table 6 CLS Indicators and improvement suggestions

Indications Affecting CLS	Description	Suggested Improvement Aspects
Dimensions of pictures	Failure to specify image dimensions results in image flickering and decreased visual stability of the website.	— Find large images, and resize to the correct dimensions
Dimensions of the video	Insufficient video sizing information may result in website visual instability issues	— Specify dimensions for videos, and iframes and this means "use explicit width and height on image elements" and means to add width + height of the element in

		HTML or CSS.
Dimensions of advertisements	Limit ads space and dynamic content - Ads without dimensions can also cause layout changes.	— Include the size most used for the declaration (or the largest size). — Using AdSense ads, it is better to use static ads with specific dimensions and not responsive ads (at least above the fold).
Dimensions of iframes	an inline frame (iFrame) is a HTML element that loads another HTML page within the document.	— Specify the dimensions of photos, videos, and iframes . — Replace YouTube iframes with a preview image.
Animation Dimensions	Insufficient animation sizing information may result in website visual instability issues	— Use CSS transform properly for animations instead of changing the width and height attributes of the animation, try using CSS transform to avoid the CLS issue.
Font Size	Fonts can cause FOIT (flash of invisible text) which can also cause layout changes. This happens when fonts take longer to load than the rest of this page	— FOIT fix (make sure text remains visible while loading web font) — Edit font of CSS file, and in font form, change font-display. This can be set to Auto, Backup, Optional, etc. — While loading fonts, the font-display: swap feature uses the backup font until the custom font is ready. The
		proposed tool is also suggested, this ensures that the text remains visible while the web font is being loaded.
Font Format	CLS is affected by fonts and CSS files which can be fixed by using font-display to ensure text is visible while web font loads and enhanced CSS	— Avoid TrueType-File Format Docs (TTF) font formats (slower than Web Open Font Format (WOFF1)). It has been replaced by the WOFF2 format, which provides a better compression algorithm which reduces the original file size by 30%, so it loads faster.

4. Conclusions:

This paper presented a systematic literature review to get an overview of the existing researches in the field of the evaluation the performance of website. Websites are an advertising front for organizations, as a result of which it is necessary to evaluate these sites according to the highest performance standards. Many performance indicators currently used to evaluate the performance of websites and different papers have been selected between 2010 to 2022 to make a complete study about the evaluation performance indicators which are: LCP, FID, CLS, PLS, SI, TBT, FID, OLT, and FLT. A statistical analysis have been presented in this study in term of performance indicators. After a comprehensive study of the previous works, it has been determined that the most researchers focus on the LCP, FID, CLS, and PLS in recent years and got high percentages with utilization rate of (93.33%), (80%), (70%), and (50%) respectively, that made them useful for design the website.

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