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Search Engine Marketing Approaches in University Libraries: Examining the Page Experience of the Central Library Website of Oran 1 University

مقاربات التسويق عبر محركات البحث في المكتبات الجامعية: دراسة تجربة الصفحة على موقع المكتبة المركزية لجامعة وهران 1

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Abstract:

This research delves into the significance of the page experience on the central library website of Oran 1 university according to Core Web Vitals, as factors influencing the performance of the university library website on Google. The study was conducted using a descriptive analytical approach, relying on CrUX, and PageSpeed Insights reports to collect data. The results demonstrated that the library website under examination provided a good page experience in LCP, INP, and CLS metrics for most users. However, the library's website encountered performance issues that disrupted the page experience for certain users.

Key words: *Search Engine Marketing; Page Experience; Core Web Vitals; University Library Website;*

ملخص:

تتناول هذه الدراسة أهمية تجربة الصفحة على موقع المكتبة المركزية لجامعة وهران 1 وفقا لمؤشرات أداء الويب الأساسية، كعوامل تؤثر على أداء موقع المكتبة الجامعية عبر محرك البحث Google. تم إجراء الدراسة باستخدام منهج وصفي تحليلي، بالاعتماد على تقارير كل من أداة CrUX وPageSpeed Insights لجمع البيانات. أظهرت النتائج أن موقع المكتبة محل الدراسة قدم تجربة صفحة جيدة في مؤشرات LCP و INP و CLS لمعظم المستخدمين. ومع ذلك، واجه موقع المكتبة مشاكل في الأداء أدت إلى إعاقة تجربة الصفحة لبعض المستخدمين.

كلمات مفتاحية: التسويق عبر محركات البحث؛ تجربة الصفحة؛ مؤشرات أداء الويب الأساسية؛ موقع ويب المكتبة الجامعية

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Introduction

University library websites are considered one of the primary sources that assist students and researchers in accessing information and benefiting from the academic content available on the web. In accordance with its mission, these websites serve the academic community and scientific research within the framework of improving the outputs of the academic institution to which they belong.

However, with the wave of digital transformation, and the increasing reliance on information and communication technology, university library websites have found themselves in the midst of fierce competition in the information market, with no alternative at hand, they are compelled to adapt to the current environmental trends, and align with the changing characteristics of users, which have been profoundly influenced by digital transformation, leading to a marked emphasis on services designed with a user-centric approach.

In light of these changes, it has become critical for university library websites to provide their services and make their resources available in a way that ensures a satisfactory user experience, and this must be done with a focus on efficiency and effectiveness, ensuring that the expected value of the services provided is achieved. In this context, the importance of enhancing the online presence of university libraries on Google has emerged. Search engine optimization has improved users' access to academic content by enhancing the library's website's accessibility via search engines, and improving the ranking of its pages in search engine results pages, which in turn ensures quick and accurate access to relevant academic materials to search queries, allowing users to make the most of the library's electronic resources and services.

Despite the fact that websites have become the primary tool for benefiting from library resources, and considering the advanced level achieved in web design and development, many websites, especially university library websites, encounter difficulties in delivering a positive user experience that fosters user satisfaction and loyalty to the library's website. These challenges are often caused by technical issues that impact the interaction between users and the website, as well as its overall responsiveness, and this plays a critical role in increasing the retention rate of users, and ensuring their return to the library's website, and these practices are an important part of a university library's search engine marketing strategies.

Discussing the marketing of a university library through search engines necessitates shedding light on search engine optimization practices both on-site and off-site. These practices include enhancements to site structure, building external links, as well as technical SEO, the latter being a critical factor influencing Google's search algorithm. Technical SEO represents the technical improvement that ensures the accessibility and indexability of the library's website by search engines, which is done through several factors, most notably the user experience during his visit, browsing and interaction with the website. It provides either positive or negative signals to Google about the quality of the website, and is measured based on specific metrics known as Core Web Vitals.

In this context, this research aims to analyze the page experience of the central library website of Oran 1 university, as it provides valuable insights into the user's experience, and the overall performance of the library's website on Google. This study is of considerable academic relevance, particularly in the context of the persistent challenges university library websites face in enhancing their online presence through search engines.

Corresponding to the current trends that university libraries are seeking to adapt to, the importance of Core Web Vitals come as one of several factors that affect the success of search engine marketing strategies in university libraries, and enhance the online presence of these libraries and optimize the performance of their websites, according to a group of performance metrics that improve the page experience, and enhance its performance on Google.

Based on the above statements, the research problem can be stated as follows: How do Core Web Vitals reflect the page experience and performance of the central library website of Oran 1 university on Google?

1. Methodological Framework

1.1. Study Objectives:

This study aims to fulfill the following objectives:

- Recognizing the importance of the page experience on the university library website as part of Google search engine marketing strategies.
- Measuring and analyzing the page experience of the central library website of Oran 1 university on Google, using Core Web Vitals metrics.
- Investigating the performance of the central library website of Oran 1 university based on Core Web Vitals metrics.

1.2. Literateur Review:

Previous studies align with current study in exploring the user experience on university library websites. However, each study examined the user experience using a distinct approach. .

(Samrgandi, 2020) the study was conducted to evaluate the user experience on the library websites of the universities in the Kingdom of Saudi Arabia to evaluate their operations, using heuristic evaluation as a research method, and compared four (04) libraries, which are:

- Umm Al-Qura University.
- King Abdulaziz University,
- King Saud University.
- King Khalid University.

This study demonstrated that adopting heuristic evaluation principles when designing an academic library website might lead to a more user-friendly experience that was both efficient and satisfying for users.

(Tella, 2020) the study examined usability, aesthetics and interactivity as predictors of undergraduates' preference for university library websites. The researcher relied on the survey as a tool to gather data. It was used on 134 final year undergraduates from two universities in Kwara State, Nigeria, these students represented the sample of the study. The latter showed that usability, aesthetics and interactivity significantly influenced students' preferences for university library suggesting the need for enhancing interactivity to improve these websites, and thereby increasing the preference by users for university library websites.

(Shevchenko, 2020) the study analyzed the website users' behavior on the State Public Scientific-Technological Library of the Siberian Branch of the Russian Academy of Sciences website. It focused on improving access to the library resources through optimizing virtual information and library services, by means of tracking user interactions, identifying popular content and browsing patterns. To gather insights on the website performance and user behavior, web analytics tools (Google Analytics and Yandex Metrica reports) were used. The findings revealed that using web analytics reports led to an enhancement in the website usability and functionality of the library under study.

1.3. Materials and Method:

In order to examine the page experience on the central library website of Oran 1 university on Google, a descriptive analytical approach was used, to provide a technical assessment of the library website's performance, and analyze the factors that influence the overall page experience on it.

The study was conducted according to the Core Web Vitals provided by Google, to evaluate the quality of the page experience through Chrome browser, which included:

- Largest Contentful Paint (LCP).
- Interaction to Next Paint (INP).
- Cumulative Layout Shift (CLS).

N.B. An update has been implemented by Google on September 9, 2024, where First Input Delay (FID) is no longer a Core Web Vital, and has been replaced by the Interaction to Next Paint (INP) metric. (Walton, 2024)

To conduct a comprehensive analysis, the study relied on two (02) tools, leveraging CrUX data, to gain insight into the library website performance based on real user experience. In addition to WebPageSpeed Insights, which provided a comprehensive audit of the central library website performance through a detailed report that revealed the most important technical issues, and recommendations to improve the page experience on the library website.

2. Conceptual Framework

University Library:

University library is a library system founded, managed and sponsored by university to fulfill the information, research and educational needs of its users (students, faculty, employees). (Chukwuji & Umeji, 2020)

Overview of the Central Library of Oran 1 University:

The library of Oran 1 University, established in 1966, is one of the key services offered by the university. It supports the academic community, including students and faculty members, by providing access to a collection of approximately 48,933 publications covering various disciplines, such as applied sciences, humanities, and social sciences. Moreover, the library is dedicated to bibliographic guidance and training in the use of modern technologies that enhance access to scientific and technical information. In this regard, the library relies on a website as a digital interface to present its services and facilitate user access to its resources, including the Online Public Access Catalog (OPAC), subscriptions to international databases, library card issuance, announcements of university workshops, and various other offerings available at: https://buc.univ-oran1.dz/ar/ (Central library of Oran 1 university)

Search Engine Marketing:

Search engine marketing is a form of digital marketing that aims to achieve a high ranking on search engine results pages, and increase the visibility of a website, through search engine optimization, and paid search strategies. (Nyagadza, 2020)

The Importance of Search Engine Marketing:

Search Engine Marketing (SEM) combines both organic and paid strategies to enhance a website's ranking in search engine results page. It is an essential tool to increase website visibility and drive targeted traffic, supporting an organization's goals and enhancing its online presence. By implementing Search Engine Marketing (SEM) strategies, organizations can improve their webpages' rankings in search results, thereby increasing their chances of attracting relevant users. Notably, a significant proportion of internet traffic is generated through search engines and is often more valuable than traffic from other sources. This

highlights the significance of Search Engine Marketing (SEM) in improving website visibility and reaching a broader audience through optimization techniques such as keyword selection, page experience, and other strategic approaches. (Simmons & Flannery, 2023)

Page Experience:

Page experience is a ranking indicator on Google search engine algorithm, it evaluates the process by which the user interacts with the web page. (Subramanian, 2020)

Core Web Vitals:

Core web vitals is an aspect of Google's page experience algorithm, (Edgar, 2023) It is a combination of specific metrics that primarily focus on user-centered performance measurement, that aims to highlight the main aspects of web usability, such as loading, visual stability, and interactivity. (Dobbala & Lingolu, 2022)

It includes the following metrics:

Largest Contentful Paint (LCP): it represents the time it takes to display the largest content on the page during loading. The user satisfaction level concerning the time taken to display the largest content on the page ranges from 0 to 2.5 seconds, starting from the time the page is first loaded. (Vasilijević, Kojić, & Vugdelija, 2020)

First Input Delay (FID): it represents the time a user interacts with an element on the webage, starting from the first user interaction (such as clicking a link or button), until the browser running the event. A good FID must not exceed 100 milliseconds. (Król & Sroka, 2023)

Cumulative Layout Shift (CLS): it measures the visual stability of the visual elements on the page during the full page load. (Wehner, Seufert, Schatz, & Hoßfeld, 2023) if elements shift around the page suddenly, that can significantly interrupt the user's experience interacting on the page. (Edgar, 2023)

3. Results and Discussion

3.1. Core Web Vitals performance for the central library website of Oran 1 university:

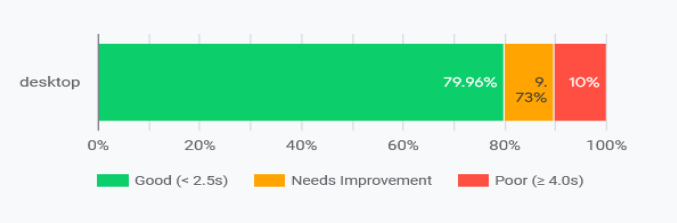
Notably, after analyzing Core Web Vitals performance for the pages of the central library website of Oran 1 university, the reports showed that the results of the measurements of all pages are identical, including LCP, INP, CLS. In light of this, the measurements were generalized to represent the performance of the central library website.

Based on the data obtained from the CrUX, and PageSpeed Insight report, for desktop version, and in line with the study's aim of measuring and analyzing the page experience of the central library website of Oran 1 university on Google, using Core Web Vitals metrics, the results are presented as follows:

3.1.1. Largest Contentful Paint (LCP) of the central library website of Oran 1 university:

CrUX report demonstrates that 79.96% of the central library website of Oran 1 university users experienced a good LCP ranged between 2.5 seconds or less, signifying that the vast majority of users had a smooth experience, owing to the efficient performance of the LCP of the central library website. Whereas 9.73% of the central library website users rated their experience as needing improvement, where they encountered an LCP ranging from 2.5 to 4 seconds, referring that user experience needs optimization to increase user satisfaction. While the rest 10% of users experienced a poor LCP (more than 4 seconds), which reflects the significance of major improvements needed to be enhanced to this slice of users. These percentages highlight the possibility of some issues impacting the time taken to load and display the largest content on the central library website, which indicates the need for further optimization to enhance its loading speed, as a notable proportion of users are facing delays, as indicated by the LCP percentages.

Fig.1. percentages of LCP performance of the central library website of Oran 1 university



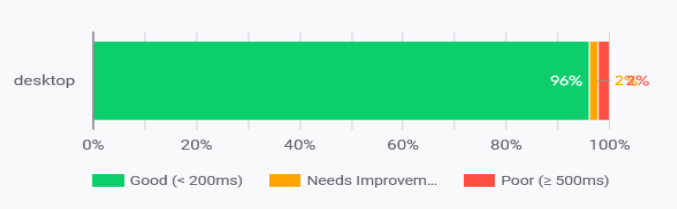
Source: CrUX report, 2024

3.1.2. Interaction to Next Paint (INP) of the central library website of Oran 1 university:

This metric is an updated metric within the Core Web Vitals, which assess the overall response of a web page to the user interaction (clicks, keyboard presses, … etc.) according to 3 levels: good, needs improvement, and poor. (Wagner, 2024)

The CrUx report revealed on INP that 96% of users had a good engagement experience on the central library website of Oran 1 university, which referring that the response time for most users was less than 200 milliseconds, this demonstrates the efficiency of the library website in responding to the user interactions, and its delivering for a highly engaging user experience. Although 96% of users had a good experience, 2% of them, their experience were categorized under needs improvement, signifying that the response time for this category ranged from 200-500 milliseconds. while the remaining 2% of the library website users lived through a poor engagement experience, as their experience took more than 500 milliseconds, it is noted that the central library website is experiencing performance issues. As such, it was necessary to implement the required improvements to reach equal responsiveness for all users.

Fig.2. percentages of INP performance of the central library website of Oran 1 university

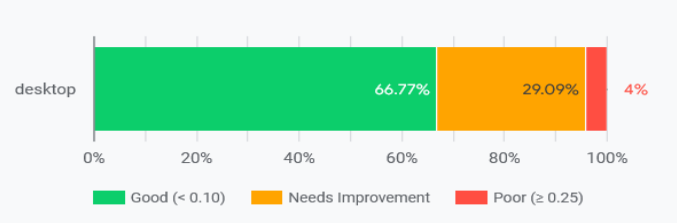


Source: CrUX report, 2024

3.1.3. Cumulative Layout Shift (CLS) of the central library website of Oran 1 university:

According to CrUx, the percentage of users of the central library website of Oran 1 university who received a good CLS rating was 66.77%, meaning that 66.77% of users experienced a CLS less than 0.10, indicates that most library users are encountering minimal layout shifts as the page loads, led to a smooth and stable visual experience. Despite this, 29.09% of users rated their experience as needing improvement, implies that their CLS recorded a value ranging between 0.10-0.25, as well as 4% of the remaining users of the central library website, who had a poor experience, which indicates that the library website encounters a high CLS value more than 0.25. It should be noted that the latter reflects the detection of issues that hinder the visual stability of the library website pages, and indicates unexpected shifts in pages' layout, which can cause a decline in user engagement, emphasizing the importance of improving visual stability and overall website performance.

Fig.3. percentages of CLS performance of the central library website of Oran 1 university



Source: CrUX report, 2024

3.2. PageSpeed Insights analysis for the performance of the central library website of Oran 1 university:

The diagnostic report of PageSpeed Insights provides a comprehensive assessment of the factors that affect the performance of the central library website of Oran 1 university, and its page experience, which directly contributes to achieving the study's objective of investigating the performance of the central library website of Oran 1 university based on Core Web Vitals metrics.

3.2.1. Outdated image formats used in the central library website of Oran 1 university:

Using outdated images formats in website design is less effective in optimizing the website's load time performance, and reducing data size. Therefore, the size reserved by these formats and their impact on loading the visual contents led to slow the central library website loading, and provided unsatisfactory experience for certain users, whose experience is categorized as needs improvement and poor in the CLS metric. In light of that, it's recommended to serve images in next-gen formats like AVIF and WebP, which provide better experience than PNG, which is used on the central library website of Oran 1 university, or by employing a plugin convert uploaded images to the suitable formats.

Fig.4. A sample of one of the approved formats on the central library website of Oran 1 university

Langues et Traduction

```
<img class="sp-
simpleportfolio-img" src="/
images/spsimpleportfolio/
chariaa/langues_600x600.png"
alt="Langues et Traduction">
```

Source: PageSpeed Insights report, 2024

3.2.2. The impact of using misconfigured sized images on the central library website's loading time and layout changes:

Image size is a key factor in website performance, as larger images slow down loading times, and cause delays in rendering the page layout, as was clearly evident on the central library website under examination, where the inappropriate configuration of image dimensions on the central library website had a negative impact on layout shift and extended loading times, leading to an unsatisfactory experience for certain users who had a bad experience (need improvement, poor) in LCP and CLS.

Therefore, it was necessary to ensure that the image sizes used in the central library website of Oran 1 university are compatible with their actual display, without the need to upload larger images. In this regard, it is recommended to use a responsive image plugin in the central library website to improve its loading time and user experience.

Fig.5. A sample of one of the misconfigured sized images identified on the central library website of Oran 1 university

Source: PageSpeed Insights report, 2024

3.2.3. Unused CSS detected on the central library website of Oran 1 university:

According to the PageSpeed Insights report, the website of the central library of Oran 1 university contains unused CSS that does not affect the website's user interface, which made the library's CSS larger than it is required, which in turn affected the library's website loading time on the one hand, and on the other hand, its negative impact extended to the LCP performance of the library's website, a factor that justifies the unsatisfactory experience of some users, whose experience was classified as poor, and need improvement.

3.2.4. Render-blocking resources detected on the central library website of Oran 1 university:

The report addressed a further issue indicating that the central library website of Oran 1 university, includes a set of resources that hinder the process of loading and displaying the basic content, which was reflected through the non-critical JavaScript and CSS used in the library website design. The latter played a role in impacting the loading time of the library website, and the page experience for some users who faced delays in displaying the content. Accordingly, it is recommended to improve the library website loading by eliminating render-blocking resources through plugins that can help to include important assets or defer less important resources.

3.2.5. Large layout shifts detected on the central library website of Oran 1 university:

The report referred to the general layout of the central library website, where it recommended the necessity of avoiding large layout shifts in the central library website of Oran 1 university to provide a comfortable browsing and effective interaction for the user.

Furthermore, the report showed in a table the largest layout shifts that occurred at its level. Layout shifts lead us to highlight the prominent sudden changes that occur to the page elements while loading or interacting with them (elements moving and jumping to another side), as this is considered one of the factors that confuse the user's experience while browsing or interacting with the page, and leaves a negative impression about the website, this indicates the experience of some users, whose experience was classified as poor, and need improvement in the INP and CLS indicators. It follows that it is necessary to take into account the consistency of the layout on the library's website to achieve an experience that allows the user to interact with the website and browse it smoothly and satisfactorily.

Fig.6. Sample of specific large layout shifts detected on the central library website of Oran 1 university

Source: PageSpeed Insights report, 2024

Conclusion

In conclusion, it can be stated that page experience plays a pivotal role in enhancing the performance of the university library website on Google. It also serves as a critical factor in the library's marketing efforts, contributing to user loyalty by offering a seamless and enjoyable browsing experience. This, in turn, encourages greater engagement with the website. The results highlight that page experience contributes to improving the university library website, which supports the study's objective of recognizing its importance in search engine marketing (SEM), as demonstrated in the website of the central library of Oran 1 university, where the Core Web Vitals of the library website were analyzed according to CrUX, and the results indicated that the page experience on the library website recorded a high percentage in Largest Contentful Paint (LCP), Interaction to Next Paint (NIP), and Cumulative Layout Shift (CLS) for the majority of its users, indicating the efficiency of the library website's performance, and its effectiveness in providing a smooth experience for most users.

However, despite these high percentages, it is important to emphasize the shortcomings in the library website's performance, and the issues detected at the PageSpeed Insights analysis, for that category of users whose experience was classified as "need improvement" and "poor", as the report revealed the importance of serving images in next-generation formats to increase loading speed, and working to exclude all resources that would hinder the library website's performance, as well as ensuring the selection of appropriate dimensions for page layout to provide a comfortable browsing experience, and ensuring an effective user interaction process on the library website.

Improving the performance issues mentioned in the reports of CrUx, and PageSpeed Insights express an effective approach to enhance the page experience on the central library website of Oran 1 university, and its online presence among its competitors on Google, in order to ensure an equal experience for all users, and to achieve its intended purpose and serve users in a way that keeps pace with current trends. Therefore, the study highlighted the importance of the page experience in enhancing the library's website performance, and recommends the necessity of periodic evaluation and analysis of university library's Core Web Vitals to assure a distinctive experience that responds to the dynamic digital environment.

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