

SEO: Tips to Minimise Bounce Rate of Website User

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Abstract

Due to extensive use of the Internet, the WEB holds an immeasurable amount of data, and Search Engines (SE) are essential tools for finding, sorting, and ranking the value of that data on the web. The potential of SEs is very significant because a major portion of web traffic is driven by SEs, such as Google, Bing, Baidu, Yahoo, etc., and their results routes end-users to specific websites. Due to the vital role of SEs, search results are becoming decisive for the website owners to compete with their rivals. Search Engine Optimization (SEO) is a key process for getting better online visibility on search results from search engines. The objective of this study is to technically justify the importance of search engines and SEO. More specifically, the main emphasis is to quantify the importance of bounce rate and load time of retaining users on the website. Data from web development blog "MLT" has been extracted to demonstrate the impact of SEO on website performance, bounce rate, and loading time. Google Analytics and Page Speed Insight have been employed to get the impact of SEO. Finally, the addition of SEO elements on an experimental project and the positive impact on websites are explained. Results attained from the experimental work demonstrate the significance of key SEO factors to minimize the Bounce rate.

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1 INTRODUCTION

The impact of technology has increased with the passage of time and web applications are the best way of providing standard facilities through the Internet. It has become a vast source of information with many websites being added every day. More than 80%

of user traffic on the Internet is handled by search engines. There are different search engines such as Google, Bing, and Yahoo [1,2]. The process to increase the visibility of a website on a search engine is called search engine optimization [3]. Moreover, with the help of the web, users spend more time reading all



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web content and consider it as the primary purpose of websites [4].

Search Engine Optimization (SEO) is directly correlated with hit ratio and frequency hits. The number of websites is increasing and, creating a stronger competition [5]. Since the internet is full of raw data, the job of directing towards relevant and exact data lies in the hands of search engines. Due to this reason, SEO techniques have become an important topic for researchers and academicians to guide the website developers to archive these goals. Search engines play a vital role in a website's effort for getting high ranking and it works to assist humans.

Web developers, web analyzers, provide statistics concerning the website (number of visitors, the average number of page views per visitor, average page duration, most requested pages, domain classes). The bounce rate is a very significant performance indicator and it represents the percentage of users who click on the website's link. Furthermore, immediately leave after viewing only a web page. Figure 1 illustrates the concept of bounce rate, where a visitor of webpage 'A' immediately exit without clicking on page 'A' and close the browser window [6].

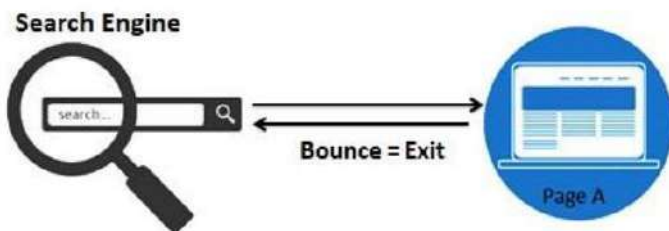


Figure 1. A bounce rate example

Normally, a high bounce rate indicates that the search engine results page (SERP) attracts end-users. Moreover, for a search engine, a high bounce rate would indicate that the website isn't valuable enough to be listed on the SERP. Figure 2 shows an example of the 50% bounce rate [6].

The main objective of this paper is to study the role of SEO, e.g. timing of user session, bounce rate, speed of the opening website, average duration, bounce rate and increases the number of page views on the ranking of a website. This research shows the change in



Figure 2. An example of Web page with 50% Bounce Rate

the search results ranking and the number of views of a website, "MLT" (mylatesttrick.com), because of using SEO techniques based on Google ranking criteria.

The paper is organized as follows. Section 2 describes the related work. Section 3, describes the importance of SEO, and implementation consideration is elaborated in section 4. Section 5 describes the results of the experiment while Section 6 concludes the paper.

2 LITERATURE REVIEW

Web developers are now using Google Analytics to reduce the bounce rate and load time. Several studies [4, 6, 7, 8, 9, 11] have investigated the use of SEO through Google Analytics to monitor and optimize different websites. Website performance was previously analyzed using traditional metrics based collected through log file analysis [6, 7, 8]. More specifically these studies used six metrics in improving content, entry, the exit of the user, and search terms [7], user time on the web, exit page, and referrals [6]. Four metrics in improving and evaluating the accessibility

of user (search engine, search terms, the entry point of user and referrer) [6, 7, 8] while two metrics were related to platform statistics and browser design.

Another study conducted by Xue, Susan [7], metrics is useful for the improvement of design and investigated this with an actual user using a website. Another important study is carried out by Peacock's [6] framework of 20log-based metrics for improving the user experience for a museum web application. This framework was the first step for creating and evaluating models for the museum website. However, some inaccuracies were encountered when using log files [6]. Another technique is the use of page tagging for collecting data from a web application. This approach involves adding new lines of script to a website page to gather user statistics, data is collected when the websites are loaded in the users' web browsers and the page tags are executed. Page tagging is much more accurate than collecting data from server log files for web analytics. However sometimes client-side data collection is the only alternative since search engine crawlers and spiders are unable to execute page tags written in JavaScript [6,9].

Google Analytics is used for page tagging to track website users [6]. Google acquired Urchin Software Corporation [10], developers of Urchin web statistics analysis software, in 2005 after renaming it to Google Analytics, released it for free public use in 2006. Google Analytics has received interest from researchers and scholars who have found it to be quite useful. This tool is used to evaluate and improve the website design, development, content, search engine ranking, and user tracking [11] and an archival services web site [5]. Google Analytics was used to help evaluate website performance and improve its various aspects [5, 11]. Gokhan Egri and Coskun Bayrak conducted a study on the performance of a website to logically explain the significance of SEO on search engine results. The foremost step was to find out the importance of user duration, minimized the bounce rate, web speed, user visit the website, page design to stay on a website [4]. However, this study puts a greater focus on the technique proposed in [1, 5].

a SEARCH ENGINE OPTIMIZATION (SEO)

Search Engine Optimization (SEO) [12, 13] is considered an element of digital marketing and is part of the process to increase website visibility on a search engine. There are two types of SEO i.e. on-page and off-page. On-page SEO focuses on website optimization while off Page, SEO is used to attract users through link building [12, 13, 14]. According to the study is contacted by Search Engine Land in 2015 [15] that Google is the leading search engine with more than 60% web traffic.

ReachLocal Digital Marketing Solutions [5] in 2016 reported that over 93% of Internet traffic originates from search engines while Google handles more than 100 billion searches per month. In the US, around 59% of adults use search engines daily [16]. According to the latest research by Borrell Associates [5], 65 billion dollars were spent on SEO in 2016, three times more than in 2008 back when Penguin and Panda did not exist. It is expected that by 2019 SEO industry will grow to 72 billion dollars and reach 79 billion dollars by 2020 [16]. Another local SEO survey work in 2015, states that 89% of websites that are built according to SEOs will have an increase in their revenue in the upcoming 12 months. The median income of SEOs per year is about 50k dollars to 60k dollars and of a company is 150 – 250k per year. On average, a single SEO serves 14 clients, and 72% SEO consultancies are planning to increase hiring in 2016. Around 63% SEOs receive less than 1 K dollars from clients and 37% of SEOs have less than 20% chance of converting new leads [17].

There is a study conducted by small Biz Trend shows that 70% of small-scale B2B (Business-to-Business) websites lack a call to action resulting in higher bounce and lower conversion rates. The call of action is something designed to get a website visitor to take action. Other characteristics of small B2B websites that negatively impact their search ranking are 1. No email address on the Homepage, 2. No social media account, 3. No media description, No call to action (Home). Results can be seen by below figure 3 [24].

SMALL BUSINESS B2B WEBSITES

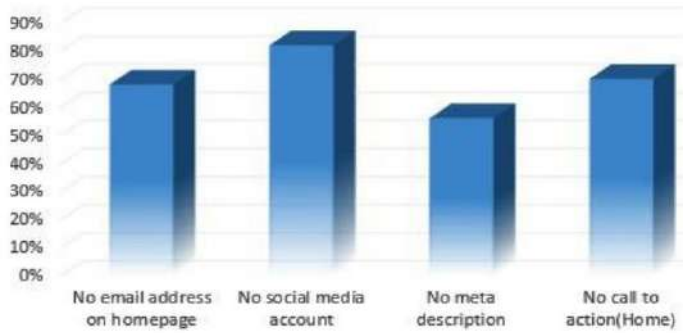


Figure 3. Small business B2B Websites Survey

Among the various ways to attract and keep users on the website, some are discussed in the subsequent sections. However, first, there is a need to understand how Google Analytics calculates bounce rate.

b Screen Analysis/Web analytics

Measuring, analyzing, reporting, monitoring and collecting web usage data to understand user experience is called web analytics. Panda and Penguin are the algorithms of google to check the quality of web content and links. Analytics can help the developer to track users and improve customer satisfaction. The most common method to collect web traffic for a website is Google Analytics [18].

c Bounce rate

Like most of the metrics used in Google Analytics, the bounce rate is also a measure of visitors' lack of interest in a specific website when they arrive there from search engines. Put simply, the bounce rate is trying to quantify the number of internet users that arrive on a specific website i.e. hit a page, and then leave [19]. This tool not only generates the statistical information in terms of session length but also statistics collected from page trackings such as average visit duration, landing page, and referral source. Moreover, we can generate a keywords based listing to determine which keywords cause higher bounce rates, as shown in Figure 4

Analytics provides detailed web statistics about user website visits. This tracking records traffic by inserting HTML code into the website's head tag.

Page	Page Views % of Total	Unique Page Views % of Total	Avg. Time on Page Avg for View	Entrances % of Total	Bounce Rate Avg for View
	1,916 100.00% (1,916)	1,595 100.00% (1,595)	00:02:12 Avg for View: 00:02:12 (0.00%)	1,283 100.00% (1,283)	76.54% Avg for View: 76.54% (0.00%)
1. /2013/01/how-to-hack-mobile-phone-wi-th.html?m=1	890 (46.45%)	704 (44.14%)	00:02:37	701 (54.64%)	73.32%
2. /2013/01/how-to-hack-mobile-phone-wi-th.html	274 (14.30%)	240 (15.05%)	00:01:56	238 (18.59%)	80.67%
3. /2013/01/top-password-crackers-breaker-s-and.html?m=1	74 (3.84%)	67 (4.20%)	00:01:53	7 (0.55%)	100.00%
4. /2013/01/how-to-hack-facebook-cookie-stealing.html	62 (3.24%)	58 (3.64%)	00:03:28	54 (4.21%)	88.89%
5. /	61 (3.18%)	55 (3.45%)	00:04:01	50 (3.90%)	82.00%
6. /2015/06/top-blueooth-hacking-tools-e-thical.html?m=1	49 (2.54%)	37 (2.32%)	00:00:53	35 (2.73%)	80.00%
7. /2013/01/how-to-hack-facebook-cookie-stealing.html?m=1	38 (1.98%)	35 (2.19%)	00:03:15	35 (2.73%)	91.43%

Figure 4. Bounce Rate and Avg time of MLT website

The bounce rate can be computed as following equation 1 [20]:

$$B_r = \left(\frac{T_v}{T_w} \right) * 100 \quad \text{-----(1)}$$

Where:

Br = Bounce rate;

Tv = Total Number of visitors who only visit one page;

Tw = Total Numbers of visitors to your website

To understand better understanding of bounce-rate suppose we have the following values.

$$T_v = 650$$

$$T_w = 2424$$

To calculate the bounce rate of a specific web page, we simply put Tv and Tw values in bounce rate formula

$$B_r = \left(\frac{T_v}{T_w} \right) * 100 \quad 650$$

$$B_r = (2424) * 100$$

$$= 73.32\%$$

The bounce rate of the website is calculated as

$$T_v = 4039 \text{ and } T_w = 5400$$

$$B_r = \left(\frac{T_v}{T_w} \right) * 100$$

$$B_r = \left(\frac{4039}{5400} \right) * 100 = 76.54\%$$

The authors in [21] reported some important threshold values of the bounce rate to evaluate the

quality of the website is presented in Table 1. For example, if the user is staying on the website around 50 seconds then it is considered in a magnificent bounce rate. In case of an exceptional bounce rate around 30 seconds and so on.

Table I: Important Threshold values of bounce rate.

S. No	Parameter	Score
1	Magnificent bounce rate	$0 \leq 20$
2	Exceptional bounce rate	$20 \leq 40$
3	Regular bounce rate	$50 \leq 60$
4	Meager bounce rate	$70 \leq 80$

d session duration

The session duration of the user shows how the user is staying on the website and the rate of leaving the website.

Over the years, Google search algorithm has undergone two major updates namely Panda in 2011 and Penguin in 2012 aimed at removing low-quality pages and pages that used illegal SEO techniques respectively [22]. People use keywords to search on Google search and if a user leaves a website immediately after visiting it then it implies that the search keyword was not relevant to the topic [23]. Figure 5 and Table 2 show the results of MLTs analysis showing the session duration, number of sessions and page views. Table



Figure 5. Session time of MLT Website

II: Results of Session Duration (MLT)

Session duration	Sessions	Page views
0 – 3sec	632	940
4 – 10sec	216	356
11 – 28sec	158	246
29 – 40sec	115	178
41 – 88sec	101	124
89 – 180sec	48	56
181 + sec	13	16

The Average session duration can be computed by using the following equation 2 [24]:

$$S_{AD} = \left(\frac{SD}{S} \right) \text{ -----(2)}$$

Where:

SAD = Average Session Duration

SD = Session Duration

S = Session

To understand more accurately average session duration, suppose we have the following values.

SD = 100 and S = 10

To calculate the bounce rate of a specific web page. We simply put S D and S values in the bounce rate formula.

$$S_{AD} = \left(\frac{100}{10} \right)$$

Average Session Duration = 10 seconds

e Bounce Rate: Profit Index

Bounce Rate can be reduced by web pages from the profit index. Web pages that see the most are also the ones that lead to the most conversions and included in the index of profit (Profit index). If the most viewed pages suffer from a high bounce rate that would affect the overall performance of the website. Hence, it is suggested that the bounce rate of these pages should be reduced to enhance conversion [25]. To take the input from Google analytics, we have retrieved our MLT website data reports it can be seen in Figure 6 that 2 out of 10 pages show an Average Page Load Time. its shows that 2 web pages have more bounce rate.



Figure 6. Profit index of MLT Website

f Importance of Web Landing Pages

Himanshu Sharma [24] the founder of Optimize smart company discussed the correlation between landing

pages of website and web page visitors. The core discussed reasons are listed below:

- Bad design of the web page is the most common reason for users to leave the website.
- Secondly, use of poor navigation to the website
- If the design is not responsive, it is the third reason
- Too much advertisement or banner or messages is the fourth reason
- Fifth is the web page contains too much text
- Sixth is the use of bad formatting in the text (not bold, italic or underline)
- Inconsistent use of line spacing, cell spacing or paragraph spacing
- Lack of using different headings or subheading
- No use of Multimedia (audio/ videos or image)

Web pages that include interesting content are also gaining the interest of the user and recommend these pages to the visitor to reduce the bounce rate [26].

3 IMPLEMENTATION CONSIDERATION

Google Analytics tool can be used to examine the average time that a user spends on a website using a measure called "Average Time Spent" as shown in Figure 7.

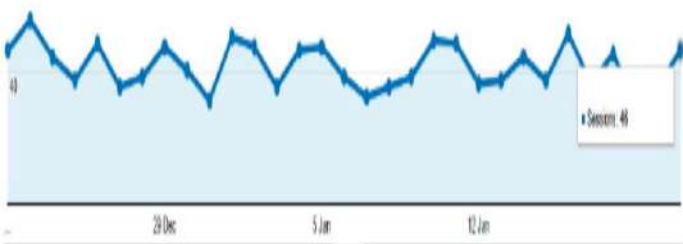


Figure 7. Average spent time of MLT Website

Suppose if there are three visitors on the website: visitor 1, visitor 2, and visitors 3. If Visitor 3 views the home page and leaves the website immediately then the session duration will be 0:00. This is to say that the user is not staying on the website causing the bounce rate to be increased. Similarly, if Visitor 2 views different pages such as the homepage and Ethical Hacking page then as a result the total session duration is 0:30. Lastly, since Visitor 1 viewed three pages

of the website so their overall session duration is 1:15 sec as shown in Table 3.

Table III: Visitor wise detail

Page viewed	time (sec)	time on page (sec)	session duration
Visitor 1			
/ SEO-tools	00:00	0.50 – 0 : 00 = 0 : 50sec	
/ (Home-page)	00 : 50	1 : 15 – 0.50 = 0 : 25sec	
/ On-page-SEO	01:15	???-1:15+ = 0 : 00sec	1:15 sec
(Left)		???	
Visitor 2			
/ Homepage	0:00	0:30-0:00 = 0 : 30sec	
/Ethical-Hacking	00 : 30	???-0:30 = 0 : 00 sec	
(Left)	???		0 : 30sec
0			
Visitor 3			
/ Homepage	0:00	???-0:00=0:00 sec	
(Left)	???		0:00 Sec

The Average Time duration can be calculated with the following equation 3 [21]:

$$T_{ap} = \left(\frac{T_p}{P_v - U_e} \right) \quad \text{---(3)}$$

Where:

T_{ap} = Average Time on Web Page

T_p = User Time on Web Page

P_v = Page views of Websites

U_e = User Exit website

To understand more accurately the average duration time, suppose a user loaded three pages at 12:10:00, 12:10:40 and 12:10:50 so stats would be of these pages.

Page 1: views 1, time on page: 10 sec

Page 2: views 1, time on page: 30 sec

Page 3: views 1, time on page: 0 sec

$$T_p = 40\text{Sec}$$

$$P_V = 3, U_e = 1$$

$$T_{ap} = \left(\frac{40}{3-1} \right) = 20\text{Sec}$$

By analyzing the search keywords, average page views, session duration and bounce rate of websites can easily build a list of keywords that do not result in a higher bounce rate. Keywords are very important for a website to rank on the search engine. Figure 8 presented the details of keywords, number of sessions for each keyword MLT website. For example, "how to hack a phone with Bluetooth" has 47 sessions.

Keyword	Acquisition		Behaviour		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages/Session
	1,025 % of Total: 79.99% (1,283)	91.12% Avg for View: 90.26% (0.96%)	934 % of Total: 80.66% (1,158)	77.07% Avg for View: 76.54% (0.70%)	1.49 Avg for View: 1.49 (-0.31%)
1. (not provided)	755 (73.66%)	89.80%	678 (72.59%)	78.41%	1.50
2. how to hack a phone with bluetooth	47 (4.59%)	97.87%	46 (4.93%)	70.21%	1.60
3. how to hack android phone via bluetooth	19 (1.85%)	94.74%	18 (1.93%)	84.21%	1.21
4. how to hack other mobile camera using bluetooth	18 (1.76%)	94.44%	17 (1.82%)	83.33%	1.50
5. how to hack a smartphone using bluetooth	9 (0.88%)	100.00%	9 (0.96%)	66.67%	1.44
6. how to hack a phone through bluetooth	8 (0.78%)	87.50%	7 (0.75%)	62.50%	1.88
7. how to hack mobile phones via	8 (0.78%)	100.00%	8 (0.86%)	100.00%	1.00

Figure 8. Session keywords about how many session and users

for specific keywords of MLT website According to the chief admin of the search quality department and the head of the web-spam, Matt Cutts, the time spent on websites and specific webpages is a determinant of search results ranking of websites since April 2010 [25]. Google Analytics provides this information freely for any website and as can be seen in Figure 9, which shows single pages sessions, new sessions, and new users, pages per session, and bounce rate of a single page of the website [26].

To measure the performance of the MLT website, we have tested the website through the opensource tool GT Matrix [27]. Table 4 presented the speed of MLT website and overall performance grade is 84. The rest of the things as total load before the experi-

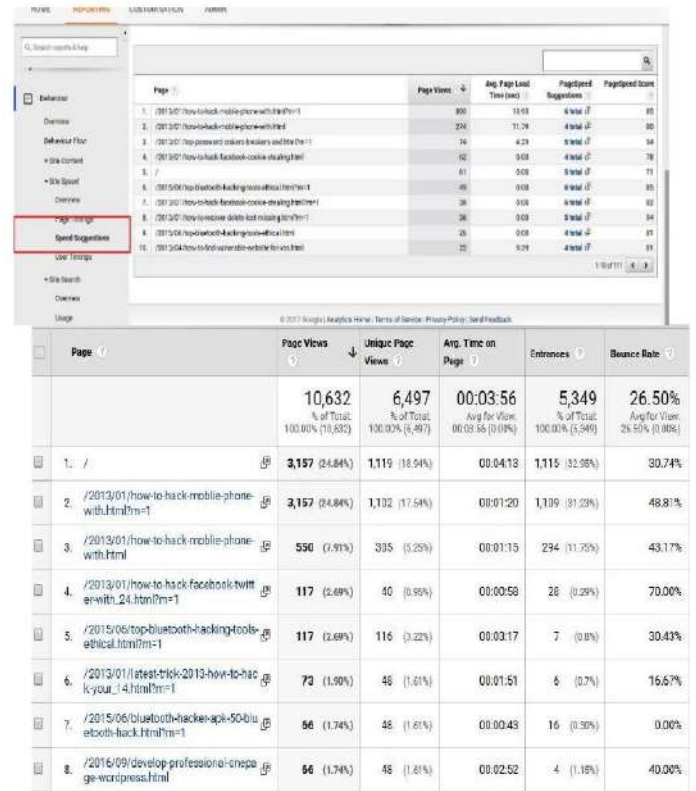


Figure 9. Single pages session, new session, new user, page session, and bounce rate of a single page of the website.

ment was 9.31 second and page size 1.6 MB.

Table IV: Result of MLT website from GTMatrix

Classification	Values before Experiment	Values after Experiment
Performance Grade	84 MB	87 MB
Load Time	9.31 second	1.96 second
Faster than	15%	72%
Page size	1.6 MB	2.6 MB

a Suggestion from Google Analytical Google Analytics tracks the load time of pages and shows a score with some suggestions to improve it as presented in figure 10.

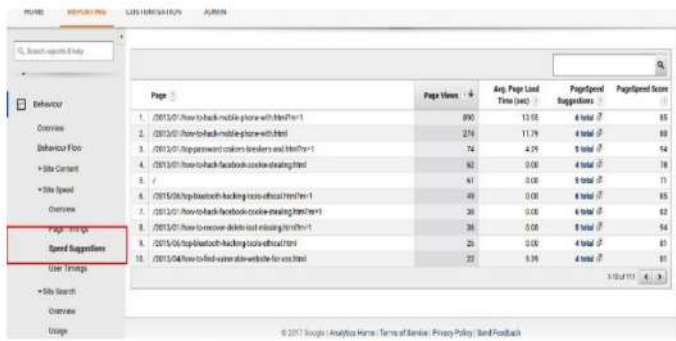


Figure 10. Suggestion for mylatesttrick.com web from Google Analytical

4 EXPERIMENTAL ANALYSIS

This study is used the example of a web development blog called, "MLT", to demonstrate the impact of SEO on website performance using Google Analytics. All experimental data is collected, analyzed, and extracted from Google Analytics. Several techniques are applied to reduce the bounce rate and website loading time.

For this work, we also used another Google service called Page Speed Insight [29] to evaluate the websites' speed to identify what areas to focus on to reduce the website's loading time. By making a few changes such as usage of CDN i.e. (Content Delivery Network), image measurement descriptions, JavaScript, CSS, and HTML reduction of file sizes, we can create landing pages that load faster and are visually appealing by minimizing requests for refreshing the CSS. Furthermore, the other suggestions include combining images through CSS sprites, describing characteristics of data, support the architecture of cache, study scrambled pictures, also neglect the features of DOM and iframe practice. Add some inbound (incoming), and outbound (external) links to web pages in web application content and always open a web link in a new window or tab. Reduction in the bounce rate of the website pages that are part of the profit index and optimizing pages for mobile devices (responsive). Content readability was improved by impalement (subheading, proper paragraph, Images, content added with bullet points.

One of the main reasons for the increased bounce rate is website pop-ups (irrelevant pop-ups are annoying) and they must be avoided. Targeting keywords

with high- value traffic, tackling 404 errors by redirection can also improve your page loading speed. 68% of visitors leave a website because of a lack of a user-friendly website [10]. In most cases, researchers can identify 85 of the problems of a website by using five visitors in a usability test. The importance of usability tests can be seen in the famous "300 million dollar button story" where a company simply changed "register" to "continue" and achieved the 300 million dollars [12]. Efficiency tests with the help of users before website launch can be very useful and it can be done using mouse tracking software, eye-tracking devices, directly seeing users, and screen capturing. This will help in understanding which pages are attracting users to stay longer and therefore, they are performing better and important.

Table V: Google Analytics results before & after improvement

Parameters	Before improvement Values	After improvement Values
Session	1283	5349
Users	1174	4832
Page Views	1916	10632
Page/session	1.49	3.56
Avg. Session duration	1 min5sec	3 min56sec
Bounce rate	76.54%	26.50%
% New session	90.26%	89.11%

For this study, making some minor changes as recommended by Page Insights tool and based on the data collected from Google Analytics. There is a change in the user behavior and the keywords searches being made by users were now leading them to MLT although autocomplete. Moreover, suggestions on Google search is also a contributing factor resulting in a drop of bounce rate to 27% from a previous 77% before the improvements. The results can be seen in table 5 that shows the usual calculation of visitors per day such as session 1283 with number of users 1,174 and Pages session is 1.49 with average session 01:05.



Figure 11. Google Analytical result of MLT Website before and after the experiment

To improve the result of the website, we applied different techniques as presented in section 4. We found some significant changes in MLT website and the number of users increased from '1,174' to '4832', the number of sessions increased from '1,283' to '5,349', page views moved from '1,916' to '10,632', Pages/session increases from 1.49 to 3.56 and Average session duration increased to 3:56 second from 1:05 in figure 11.

Table VI: Bounce Rate of MLT

Month/Year	values
1-15 June 2019	76%
15-30 June 2019	72%
1-15 July 2019	61%
1-30 July 2019	51%
16-28 August 2019	43%
1-15 August 2019	30%
15-30 September 2019	26%

The bounce rate is decreased to 26.50% changes from 76.54% presented in Table 6. It describes the result for improving the user's stay time on the website that reduced the bounce rate. The bounce rate is 76.54% in December and reduced to 26.5 in Sept 2019 after certain countermeasures as presented in figure 12.

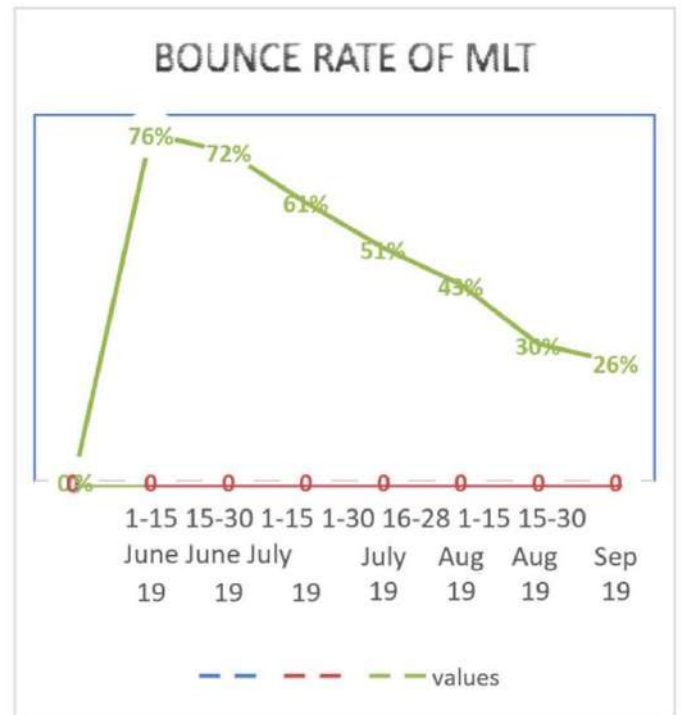


Figure 12. Bounce Rate of MLT

After applying the changes, the result shows that "mylatesttrick.com" is beginning to obtain a better position on search engine results. Additionally more than 5 thousand visitors in June 2019 while in September 2019 only thousand visitors as shown in figure

13. Since more than 60% of visitors are accessing through Google, which shows an increase in visitor's ranking. Event pages in the year of June '19 to Sept'19 as presented table-VII.

Table VII: Number Of visitors of MLT

Month/Year	Session
1 – 15 June 2019	1430
1 – 30 June 2019	1670
1 – 15 July 2019	1830
1-30 July 2019	1970
16 – 28 August 2019	3465
1-15 August 2019	4132
15-30 September 2019	5267

During the study, we examine this site (mylatesttrick.com) from Dec 2019 to Sept 2019; we find that "mylatesttrick.com" recently getting a new and higher place on search engines and getting more visitors as presented in figure 13.

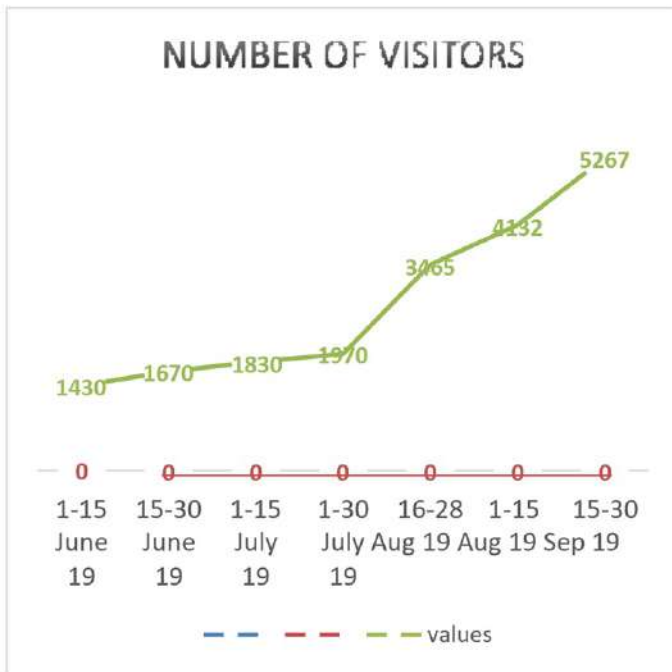


Figure 13. Number of visitors on the MLT Website

5 CONCLUSION

Search Engine Optimization (SEO) is a type of research that helps developers to get better results in Search Engines. Moreover, these search engines are playing an

important role in any access, facts, and figures on the internet. It is important to enhance web pages with the passage of time. Today, Google has delivered vital appraises just to keep away from fighting junk websites, i.e. Panda algorithm and Penguin. While the researchers of this experiment observe all the updates so they can realize that still there are many features of developments and unique features for SEO is left. An essential aspect of this is the period of stay on the website. In this paper, an experimental study is on mylatesttrick.com to improve the ranking of a website, reduced bounce rate, and load time of a website. We found significant changes in the website and number of user increased from ' 1,174 ' to ' 4832 ', the number of sessions increased from ' 1,283 ' to ' 5,349 ', page views moved from ' 1,916 ' to ' 10,632, Pages/session increases from 1.49 to 3.56 and Average session duration increased to 3:56 second from 1:05. Also, the bounce rate decrease to 26.50% changes from 76.54%. Future research will be based on the development of an upgraded more technique to improve the ranking of a website.

Author Contributions

Muhammad Noman Khalid and **Muhammad Iqbal**: conceived the study and developed the theoretical framework and performed the experiments. **Amir Manzoor** and **Malik Muneeb Abid**: aided in the analysis and supervised the project. **Samar Raza Talpur**: contributed to the final version of the manuscript. All authors discussed the results and contributed to the final manuscript.

Compliance with Ethical Standards

It is declared that all authors don't have any conflict of interest. It is also declared that this article does not contain any studies with human participants or animals performed by any of the authors. Furthermore, informed consent was obtained from all individual participants included in the study.

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References

- [1] Anett Erdmann, Ramon Arilla, Jose M. Ponzoa., "Search engine optimization: The longterm strategy of keyword choice.", *Journal of Business Research* 144 (2022) 650-662
- [2] Tran Duc Le, Thang Le-Dinh, Sylvestre Uwizeyemungu. "Search engine optimization poisoning: A cybersecurity threat analysis and mitigation strategies for small and medium-sized enterprises.", *Technology in Society* 76 (2024) 102470.
- [3] Barbar, A., & Ismail, A. (2019, April). Search Engine Optimization (SEO) for Websites. In *Proceedings of the 2019 5th International Conference on Computer and Technology Applications* (pp. 51-55). ACM.
- [4] Poulos, M., Korfiatis, N., & Papavlassopoulos, S. (2020). Assessing stationarity in web analytics: A study of bounce rates. *Expert Systems*, 37(3), e12502.
- [5] Patrick Maillé, Gwen Maudet, Mathieu Simon, Bruno Tuffin. (2022)., "Are Search Engines Biased? Detecting and Reducing Bias using Meta Search Engines", *Electronic Commerce Research and Applications*, doi: <https://doi.org/10.1016/j.elerap.2022.101132>.
- [6] Ruoyuan Gao, Chirag Shah., "Toward creating a fairer ranking in search engine results", *Information Processing and Management*, Vol. 57, Issue 1, January 2020, 102138
- [7] Nagpal, M., Petersen, J.A., "Keyword Selection Strategies in Search Engine Optimization: How Relevant is Relevance?", *Journal of Retailing* Volume 97, Issue 4, December 2021, Pages 746-763.
- [8] Mittal, C. (2023). IMPORTANCE OF WEBSITE OPTIMIZATION THROUGH SEO (Doctoral dissertation).
- [9] Eckman, J. M., Eckman, D. A., Cormier, R. R., Del Muro, M. A., & Greenfield, J. D. (2019). U.S. Patent Application No. 16/280,692.
- [10] Belair-Gagnon, V., & Holton, A. E. (2018). Boundary Work, Interloper Media, And Analytics In Newsrooms: An analysis of the roles of web analytics companies in news production. *Digital Journalism*, 6(4), 492-508.
- [11] Ronghao Pan, Antonio Ruiz-Martínez, "Evolution of web tracking protection in Chrome", *Journal of Information Security and Applications*, Volume 79, 2023, 103643
- [12] Poulos, M., Korfiatis, N., & Papavlassopoulos, S. (2019). Assessing Stationarity in Web Analytics: A study of Bounce Rates. *Expert Systems*.
- [13] Vyas, C. (2019). Evaluating state tourism websites using Search Engine Optimization tools. *Tourism Management*, 73, 64-70.
- [14] Jansen, B. J., Jung, S. G., & Salminen, J. (2022). Measuring user interactions with websites: A comparison of two industry standard analytics approaches using data of 86 websites. *Plos one*, 17(5), e0268212.
- [15] Who's Really Winning The Search War, Available at: <http://searchengineland.com/whosreally-winning-search-war-204651>
- [16] DeMers, J. (2016). The SEO industry is worth \$65 billion; will it ever stop growing. *Search Engine Land*.
- [17] Local SEO Industry Survey, Available at: <https://www.brightlocal.com/learn/local-seoindustry-survey/>
- [18] Domazet, I. S., & Simović, V. M. (2020). The use of Google Analytics for measuring website performance of non-formal education institution. In *Handbook of Research on Social and Organizational Dynamics in the Digital Era* (pp. 483-498). IGI Global.
- [19] Geetika, M., Sahastrabudhe, M. K., & Soni, M. M. COMPARISON OF WEB ANALYTICS SERVICES. DR. DY PATIL BSCHOOL, PUNE, INDIA, 1003.
- [20] Drivas, I. C., Sakas, D. P., Giannakopoulos, G. A., & Kyriaki-Manessi, D. (2020). Big data analytics for search engine optimization. *Big Data and Cognitive Computing*, 4(2), 5.
- [21] Kameron, D. (2020). Reconsidering bounce rate in web analytics. *Journal of Digital & Social Media Marketing*, 8(1), 58-67.
- [22] Domazet, I. S., & Simović, V. M. (2020). The use of Google Analytics for measuring website performance of non-formal education institution. In *Handbook of Research on Social and Organizational Dynamics in the Digital Era* (pp. 483-498). IGI Global.
- [23] Drivas, I. C., Sakas, D. P., Giannakopoulos, G. A., & Kyriaki-Manessi, D. (2021). Optimization of paid search

traffic effectiveness and users' engagement within websites. In Business Intelligence and Modelling: Unified Approach with Simulation and Strategic Modelling in Entrepreneurship 8th (pp. 17-30). Springer International Publishing.

- [24] Himanshu Sharma "Reduce Bounce Rate in Google Analytics through these 11 powerful methods" [optimizemart.com](https://www.optimizemart.com), 2016
- [25] Petter, R. (2021). Web Analytics: Increasing commercial value through digital channels.
- [26] Dolma, Y., Kalani, R., Agrawal, A., & Basu, S. (2021, April). Improving bounce rate prediction for rare queries by leveraging landing page signals. In Companion Proceedings of the Web Conference 2021 (pp. 1-6).
- [27] Site Speed in Search Rankings, Available at: <http://www.mattcutts.com/blog/site-speed/>
- [28] GTmetrix | Website Speed and Performance Optimization, Available at: <https://gtmetrix.com>
- [29] PageSpeed Tools | Google Developers, Available at: <https://PageSpeed.com>