Optimizing the Performance of Website Performance using Google Analytics

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Abstract:

Website owners can learn vital information about the traffic to their sites and the behavior of their users with the aid of Google Analytics. Website managers can gain a full understanding of the success of their website by monitoring important indicators, such as numbers of visitors, traffic sources, popular web pages, and user interaction. Furthermore, Google Analytics offers thorough audience demographics that aid website owners in better understanding their target market and adjusting their strategies. In today's dynamic digital environment, using technologies like Google Analytics enables businesses to get critical insights and recommendations to stay competitive and meet shifting consumer demands.

Keywords: - Google analytics, APM, Demographics, Funnel Method, Engagement.

1. **Introduction:**

Businesses today recognize the importance of website optimization for building a compelling online presence and gaining a competitive edge. A vital tool for website optimization is Google Analytics, a powerful online analytics service provided by Google. The goal of this project report is to show how Google Analytics can be applied practically to improve an e-commerce website created with HTML, CSS, and PHP. In order to improve the performance of our e-commerce website, the major objective of this project is to thoroughly research the features and functionalities of Google Analytics. Using Google Analytics, we can effectively measure and examine crucial metrics like website traffic, user interaction, and conversion rates. As a result, this project provides a good illustration of how Google Analytics may be utilised to improve websites. By making advantage of the possibilities of this strong technology, we intend to enhance the functionality, user experience, and conversion rates of our e-commerce website. The lessons learned and recommendations made by this study would be helpful to businesses wishing to effectively employ Google Analytics in their website optimisation efforts.

2. **Literature Review**:

This study examines how Google Analytics is used to monitor the effectiveness of online programmes. The authors provide a case study to illustrate the effectiveness of this approach and a rundown of the key Google Analytics features that can be applied to APM[1]

In this study, the use of Google Analytics as a web-based APM tool is investigated.The authors provide a case study to illustrate the effectiveness of this approach and a rundown of the key Google Analytics features that can be applied to APM. The report emphasises Google Analytics' potential as a low-cost and user-friendly APM solution for small and medium-sized organizations[2].

This study examined the impact of website quality on patron loyalty in the context of Saudi Arabian online shopping behaviour. The findings demonstrated that the calibre of websites had a considerable positive impact on customer loyalty. This demonstrates how important website analysis and optimisation are for businesses wanting to boost customer loyalty[3].

This study examined the impact of website quality on customer loyalty in the context of the online retail sector. The results demonstrated that the calibre of websites had a considerable positive impact on customer loyalty. This demonstrates the value of website optimization and research for online retailers seeking to boost customer retention [4].

This paper presents an overview of APM techniques for micro service-based applications. The authors discuss distributed tracing, monitoring, and APM-related analytical issues in relation to microservices. The importance of APM in ensuring the level of service quality and user experience in applications that use micro services is emphasized in the article. A overview of various APM frameworks and tools that can be used in the micro services environment is also provided by the authors[5].

3. Application Performance Monitoring (APM)

Application performance monitoring (APM) is the monitoring, management, and enhancement of software application performance. It comprises keeping an eye on several application performance indicators, including as response time, throughput, resource usage, and availability, in order to identify and address performance issues before they have an effect on end users.
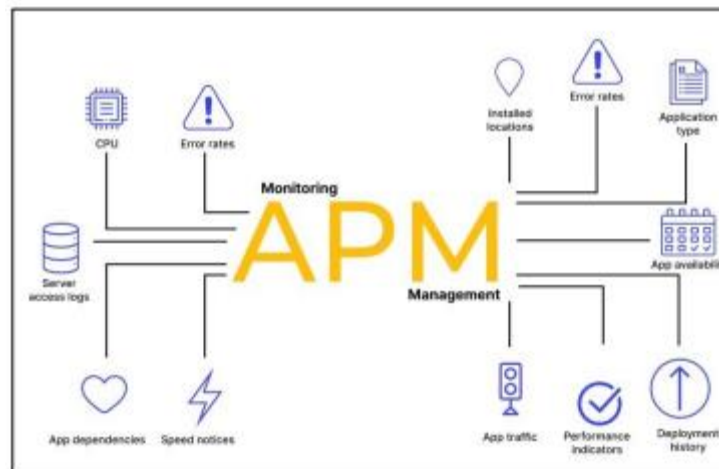

Fig. 1. APM Functionality

APM is widely used in industries including e-commerce, banking, healthcare, and technology, where application performance is essential to business success.

4. FLOW DAIGRAM WEB ANALYTICS

Web analytics services may also employ cookies to track individual sessions and recognise repeated visits made from the same browser.

No analytics platform can guarantee the complete correctness of its data since some users erase cookies and because some browsers have limits on code snippets, and different tools occasionally offer slightly different results.
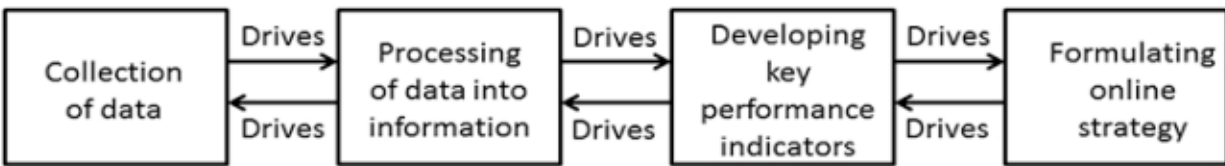
Fig. 2. WEB ANALYTICS FLOW DAIGRAM

5. EXISTING SYSTEMS

Application performance monitoring (APM) alternatives to Google Analytics' technology include:

a) **New Relic**: An all-inclusive APM solution, New Relic offers infrastructure, mobile apps, and web application monitoring and analytics capabilities. It provides real-time insight into an application's effectiveness, including response times, error rates, and resource utilisation.

b) **Dynatrace**: Dynatrace is an AI-powered APM platform that provides total visibility into application performance. It offers autonomous component identification and monitoring for infrastructure, microservices, and applications. Dynatrace employs powerful analytics and machine learning techniques to identify performance problems, underlying causes, and optimisation opportunities.

c) **Splunk**: The data analytics platform Splunk offers APM capabilities through its AppInspect and Splunk APM products. It helps organisations to collect, analyse, and visualise data from many sources in order to gain insights into the performance of applications.

6. PROPOSED METHODOLOGY FOR GOOGLE ANALYTICS:

The proposed work aims to improve the functionality and user experience of an e-commerce website by using Google Analytics for Application Performance Monitoring (APM). The project will take a scientific approach to developing and utilising Google Analytics capabilities for performance analysis, user behaviour tracking, and conversion monitoring. The following steps outline the suggested work.

1. Configuration and Integration
2. Performance Evaluation
3. User Activity Monitoring
4. Conversion tracking

5. Information and Analysis

6. Integration with other Marketing Tools

7. CONCLUSION:

With the help of Google Analytics, businesses can monitor and improve the functionality of their websites. Businesses may track crucial performance indicators like page views, bounce rates, and conversion rates using Google Analytics. Utilizing this information will enhance user experience, boost website traffic, and enhance website design. Additionally, Google Analytics links with a number of other platforms and tools, including Google Ads, offering a comprehensive view of the effectiveness of advertising campaigns and websites. Based on information about user behavior and performance, this integration helps firms to optimize their online advertising strategy.

8. EXPERIMENTAL RESULTS

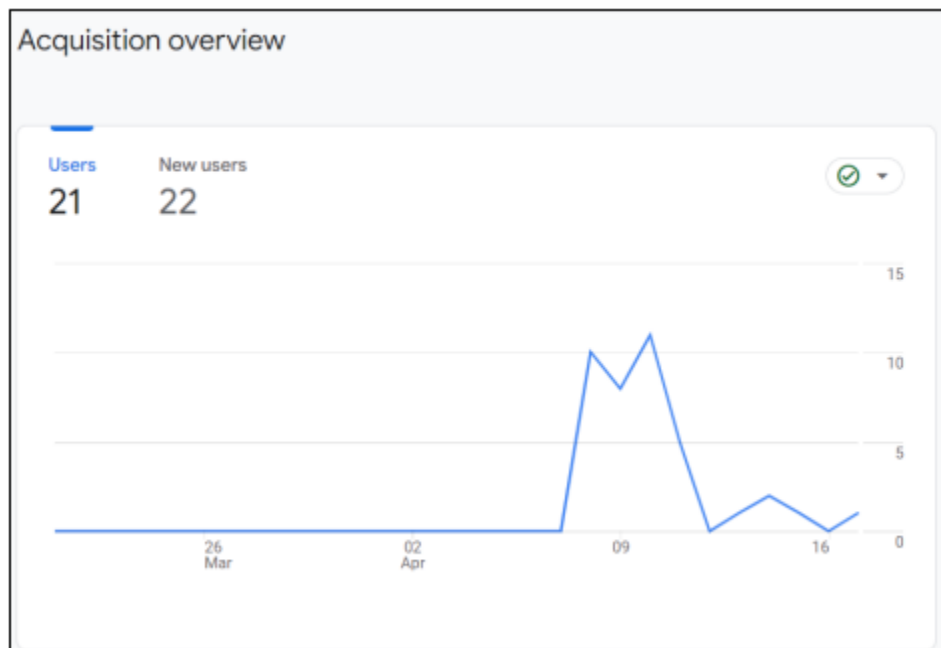a) The number of users and new users are displayed in the acquisition overview.

Fig. 3. Acquisition overview

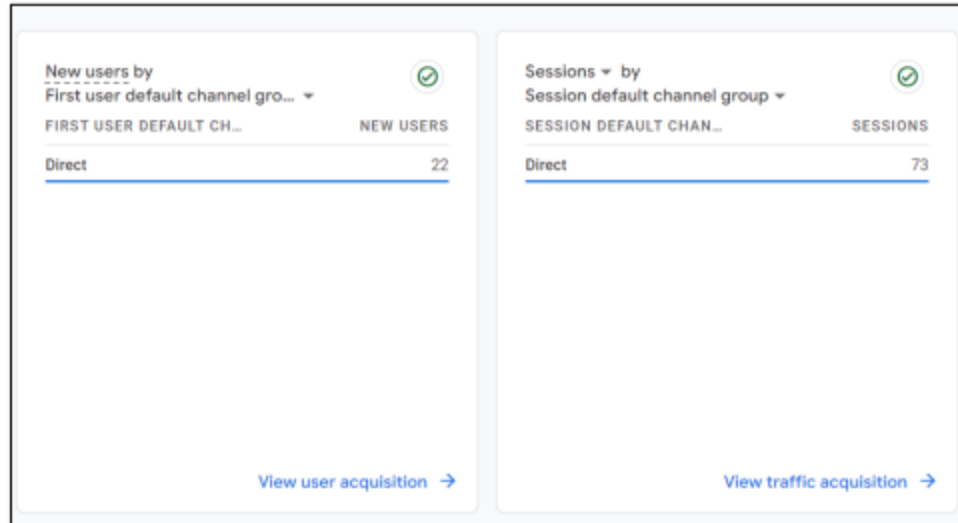b) Shows direct and indirect user count. (We do not have indirect traffic)

Fig. 4. Traffic overview

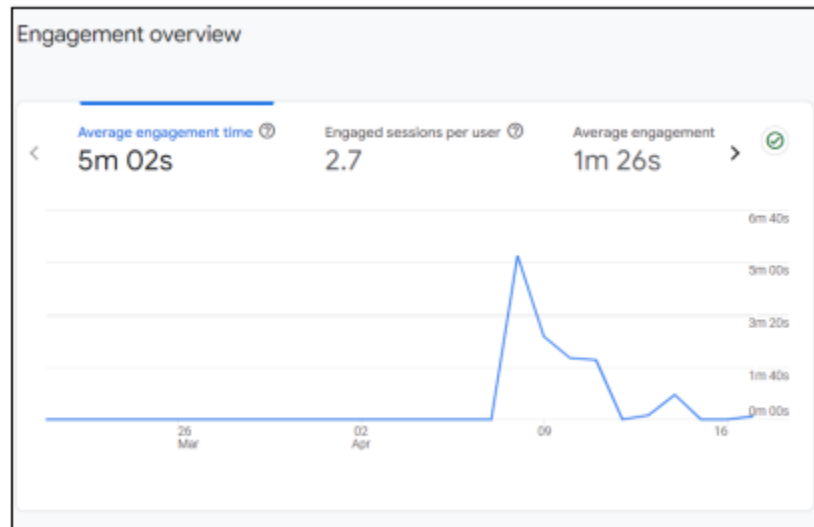c) An overview of user engagement shows how long they spent on the site on average.

Fig 5: Engagement overview.

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