Web Analytics for Knowledge Creation:
A Systematic Review of Tools, Techniques, and Practices

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ABSTRACT

Digitization efforts across the world have resulted in the need for businesses to own a website. All Fortune 500 companies run websites for either information dissemination or for transacting business. This has led to the increase in the number of websites as well as a growing competition to outdo each other. In order to gain competitive advantage, businesses need to have a detailed track of the activities going on their website to suffice their decisive knowledge. However, to monitor and to optimise the website performance, organisations need strong web analytics tools and skills. This work presents a comprehensive review of the web analytics tools and techniques, which are vital to report the website performance and usage. Present day practices of web analytics have been outlined from the perspective of business organisations, with suitable examples. A comparative analysis of the most important web analytics tools have been presented, including the free as well as subscription based tools. Future challenges and opportunities to web analytics practices have also been presented.

1. INTRODUCTION

In an age where information is power, vast amount data is being created and processed into information, this information is targeted towards the better decision making and knowledge management. Volume of the data being generated has grown so big that it has become impossible to analyse using traditional methods. Interestingly, in 2009, the volume of data created on a daily basis was estimated to be less than 1 petabyte, this has increased significantly to 2.5 quintillion bytes of data are created daily (Jamiy, et al., 2015). By 2020, the digital universe the data created copied, stored and analysed annually will reach 44 zetabytes, or 44 trillion gigabytes. According to a report by IBM Marketing Cloud, it stated that 90% of internet data were only created as from 2016, the study went further to state that data are created by business, people, and devices thus, an incredible amount of data are created or released into the internet on a daily basis (IBM Marketing Cloud, 2017). The rise in the volume of data created on the internet is positively related to the rise in the number of internet users.

They were an estimated 2.4 billion internet users in 2014, it increased to 3.4 billion in 2016, it further increased by 300 million in 2017, the number now stands at 4.4 billion internet users in June 2019 (internetworldstats.com, 2019). This represents an 83% growth in the volume of the internet users in a period of just five years. Businesses, companies and organisations are taking advantage of what the internet has to offer by setting up and internet channel or by owning a website to facilitate the achievement of the business goals which could include entertainment, blogs, social media, commerce, information etc. For businesses to dominate the market, new tactics have been developed leading to the dawn of usage of the internet as a medium to establish direct and on-going relationship with customers. Website are developed by companies for different purposes for example e-commerce; It is used to describe the sales of both goods as well as services on business to business (B2B) or business to consumer (B2C) platforms through the internet. A lot of these data are being generated on the website traffic and e-commerce website contributes significantly to this. IDC Estimates that by 2020, business transactions on the internet- business-to-business and business-to-consumer can reach 450 billion per day (Framingham, 2017). Whereas, the annual global IP traffic will reach 3.3 Zetabytes (1000 Exabyte) by 2021 (Cisco, 2017). The overall, IP traffic is expected to grow at a Compound Annual Growth Rate (CAGR) of 24% from 2016 to 2021.

However, for a website to be able to achieve its business goal, it must be dynamic and provide its users with satisfaction. To achieve this, the website administration must be provided with data that can be analysed into information so as to make informed decision and also to know if the website is functioning optimally. The interaction between the users and website provided a huge avenue to extract data on how users interact and behave while on the website. These data are usually unstructured in nature and might not useful directly for decision making until it is analysed and information is derived from it. Web data analytics is essential to grow a website; the proper analytics of a website will provide visitors data which is needed for your content optimization on the basis of the users' preference (Thejaswini et al., 2018). This will enable taking decisions that will help the website drive more traffic and achieve the business goal as web analytics is able to provide data on users' gender, behaviours, traffic source, age, demographics, time spent on website, total counts, users activities, location etc. extracting information from a website data led to the birth of web analytics.

2. WEB ANALYTICS

Web analytics is the practice of measuring, collecting, analysing and reporting on website data to know, how a website is used by its audience and how to optimize its usage (Web Analytics Association, 2008). This a methodological study of online/offline patterns and trends. Kumar et al. (2012) have defined web analytics as a technique employed to collect, measure, report, and analyse website data. "It helps to analyse the performance of a website and optimize its web usage" (Chen et al., 2012). It tracks the key metrics and analyse website visitors' activity as well as the flow of traffic. Nevertheless, web analytics is not limited as a technique of measuring website traffic alone, it is also a business tool for marketing research, as well as to determine and improve the website effectiveness. According to Duncan (2010), web analytics is especially useful for determining the changes in flow of traffic to a website during the unveiling of new advertisement campaigns. Furthermore, this is particularly useful to measure traffic as well to recognise the new developments, which can be very helpful for marketing purposes (Phippen et al., 2004).

2.1. Categories of Web Analytics

There are two broad categories of web analytics: On-site web analytics and off-site web analytics. On-site web analytics is used to monitor the functionality of the website in an exceedingly business generation perspective and is carried out by the website owners themselves. However, the off-site web analytics is used to describe an internet activity that analyses the data from a website, irrespective

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