

View Point



Web Analytics

Driving Enterprise growth through web analytics

Abstract

Success of an enterprise largely depends on its ability to effectively monitor and control its key performance indicators (KPI) and take appropriate actions to improve them. The web has revolutionized the way business is conducted and has become the paramount channel for driving growth. Organizations across the globe are capitalizing on the power of web through various means like advertising, order management and delivery of products/ services. In order to measure the performance of web based initiatives, the organizations accumulate huge volumes of data. This data, on careful processing, can give useful insights and thus, prove to be beneficial to the organization.

Web analytics refers to data analysis for determining the effectiveness of each web based initiative undertaken by the organization. The purpose of this exercise is to make these initiatives more effective.

This article illustrates the importance of web analytics, the various tools and techniques used for the purpose, and the key players in the web analytics space.

Executive Summary

Enterprises implement several web based techniques for increasing revenue, driving growth and staying ahead of competition. Some of the common techniques include launching websites, blogs, multi-channel advertising, targeted campaigns, and referrals through partners / existing customers, paid search management, third party sites sales etc.

Web analytics play a vital role in monitoring the performance of these web based efforts. Such analysis can enable an organization in recognizing growth opportunities and turning them into competitive advantage.

Web analytics is the technique of collection, transformation and analyzing the user activities on an organization's web site. It also includes reporting user's activities for helping the organization understand website's usage and planning for optimization. The enterprise needs to implement a sound web analytics system that can provide them precise metrics which can be used to make changes to their current business strategies as well as for predictive analysis for planning their future strategies.

Business Benefits of Implementing Web Analytics

Web Analytics provides a single, consolidated, accurate view of end-to-end usage data which can be used in decision making. The key benefits of web analytics are listed below.

1. Enables cost-benefit analysis of each web based initiative and helps the organization plan future course of action. The organization will also get a view of Return of Investment (ROI) for each initiative. Thus, they can focus on the initiatives that are in a position of giving maximum return.
2. Identifies areas of improvement for each initiative and highlights the ones which should be considered for refinement.
3. Helps in analyzing the navigation patterns of the users. Thus, it can form the basis of search engine optimization (SEO).
4. Indicates the geographies that attract most visitors. This can help in planning strategies for sales and delivery as well as for activities like server deployment across geographic locations.
5. Enables enterprises to target new regions, markets, and product categories based on the analysis.
6. Indicates the time of day and seasons when users are more active. This helps in planning operations and estimating the support required for smooth business.
7. Provides sophisticated reporting for improved decision making
8. Gathers, profiles, and integrates data from disparate web applications, thereby eliminating data quality issues & exceptions. This, in turn, increases the trust factor of data.
9. Enables on-demand extraction of complex operational reports.

Evolution of Web Analytics Strategy

From being a tool used only for exception data collection, Web Analytics has now evolved to include features like analysis of user behavior, advanced reporting, real time analysis and real-time decision making. The following illustration depicts history and trends in Web Analytics.

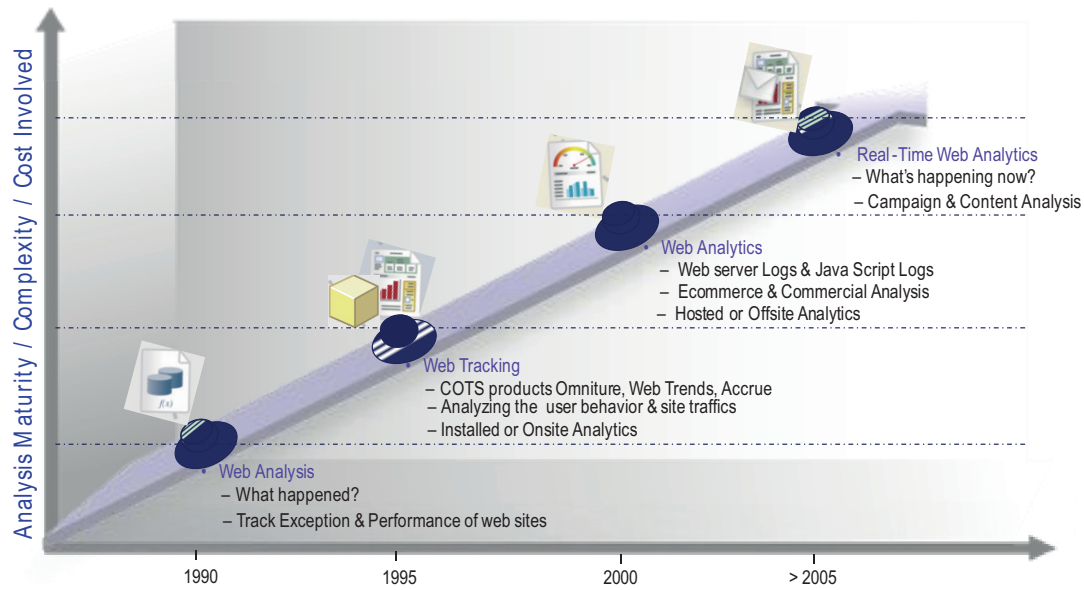


Figure 1: Evolution of Web Analytics

Visitors' data is collected from online systems primarily by scanning through [Log files](#) of the web servers and through [Page Tagging](#).

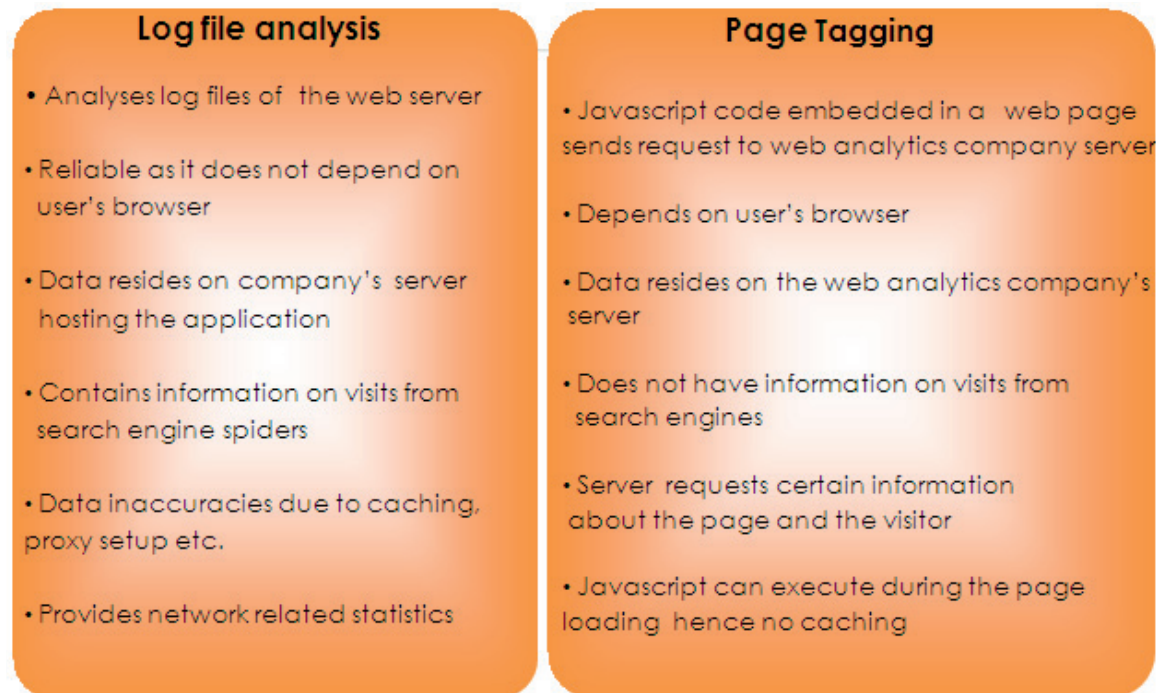
Logfiles analysis: In a web based application, each user interaction involving information exchange between application and server has a potential to log the interaction in the log file that is stored on the server. For systems that have large number of users, this logging generates enormous amount of data. The level of logging i.e. the amount of detail can be controlled by the application. It contains client side information like page tags, web beacon, exception logs, and event logs. Periodically these log files can be collected, cleansed and transformed. This data is loaded into the analytical database for further processing.

Page Tagging: Log files may contain some inaccurate data due to caching and proxy setups. To overcome this issue, each web page is embedded with page tags. On accessing the tagged web page, the visitor's activity is communicated to data collection server. This technique is called Page Tagging.

Processing for Page Tagging is simpler and faster as compared to Server Side Logging but this technique cannot provide the network related status and statistics.

Unique visitor identification is generally done using cookies or IP addresses; this technique, though widely used, is error prone as the same user may have used different browsers to navigate the web pages from two different locations/devices e.g. from office and home. Or, several different users may have navigated through the site using the same computer.

A brief comparison between these two techniques is illustrated below:



To meet network requirements, the concept of [Network data collection](#) was introduced by web traffic analyzers. Packet sniffers are placed on the web server or hardware like hub, proxy server, switch etc to collect the data required for analytical processing. These sniffers are capable of providing information like server response time, network related issues etc which impact the visitor's satisfaction quotient. The limitation of this technique is data loss and server load; hence, extra effort is required from IT side to solve the issues.

To overcome the limitation of data inaccuracies in log file analysis and the limitation of search engines in page tagging, a combination of both these techniques is generally used by enterprises. The following techniques are predominantly used:

- [Combination of Logging and Page Tagging](#) is the most commonly used technique followed by the web analyzers. This hybrid technique helps in analyzing the user behavior, downloading various data like status, usage pattern and pages cached etc. It also provides other granular information like IP Address as well as domain name of requestor, browser type and version, sign-in name, request date & time, request status, requested contents, parameters of dynamic request, response time, and cookie parameters and associated details.
- [Combination of Network Data Collection & Page Tagging](#) provides rich data for analysis from both user and network perspective. A Packet sniffer requires either web server or hardware to reside, which ultimately needs considerable maintenance effort. Page tagging is being adapted widely because the data collection is outsourced to 3rd party, who will collect data, cleanse and transform as required by the website owner. This combination is the best solution for the website traffic analysis.

The combination of one or more data collection techniques is desirable and complex. It is recommended that more attention should be given to automation and the enterprise needs to ensure that the technique reaches the right target.

Approach to Website Analysis

Website analysis is generally started at the time of website launch as a onetime activity. This analysis is usually outsourced by the organizations to service providers (SaaS) who specialize in this area. These service providers analyze the data and provide requisite reports to the organization. This is known as the Hosted approach.

In some cases, the organization deploys and manages analysis software for a specific website which is known as Installed approach. The hosted approach is used by most organizations.

The purpose of analysis of either approach can be classified based on the usage:

- E-Commerce Management to monitor
 - Conversion rates of orders
 - Revenue rate of visitor
 - Click path analysis
 - Popular page analysis
 - Entry page analysis
 - Exit page analysis
 - Keyword analysis (Paid / Non-Paid Keywords)
 - Unique Visitor / Return visitor frequency analysis
 - Analysis of visit elapsed duration per session
- Campaign Management Sites
 - Campaign tracking & analysis
 - Conversion tracking & analysis
 - Visitor path tracking & analysis
 - Referring channel analysis
 - Visitor demographics analysis
 - Visitor segmentation analysis
 - Click stream conversion rate analysis
 - Funnel analysis to track the visitor behavior
- Content Management Sites
 - Referring Keyword / Pages
 - Search success analysis
 - Popular content analysis
 - Content download volume / traffic analysis
 - Analysis on Content download stats
- Support & Service Management Sites
 - Stats average
 - Summary stats
 - Analysis on Visitor's geographical locations
 - Browser Stats
 - Operating System Stats
 - User Access Management
 - Bounce rate analysis

The above metrics can be broadly classified into any of the categories like ratio, counts, key performance metrics/indicators (KPI).

- **Ratio** is the calculated value resulted by dividing count by count or another ratio (e.g. Average Visit Time per Visit).
- **Count** is not derived from other measures. It is the total number of an attribute or action (e.g. Total Number of Unique Visitors).
- **KPI** is associated with business targets (e.g. Success conversion rates) which the management monitors on real-time basis to take appropriate decision.

The metrics can be displayed to the analysts as Unit (e.g. Visitor path at a given date time), Aggregate (e.g. Total no. of visitors), and Segregate (e.g. No. of visitors by locations). The figure below illustrates the major steps of the web analysis life cycle.

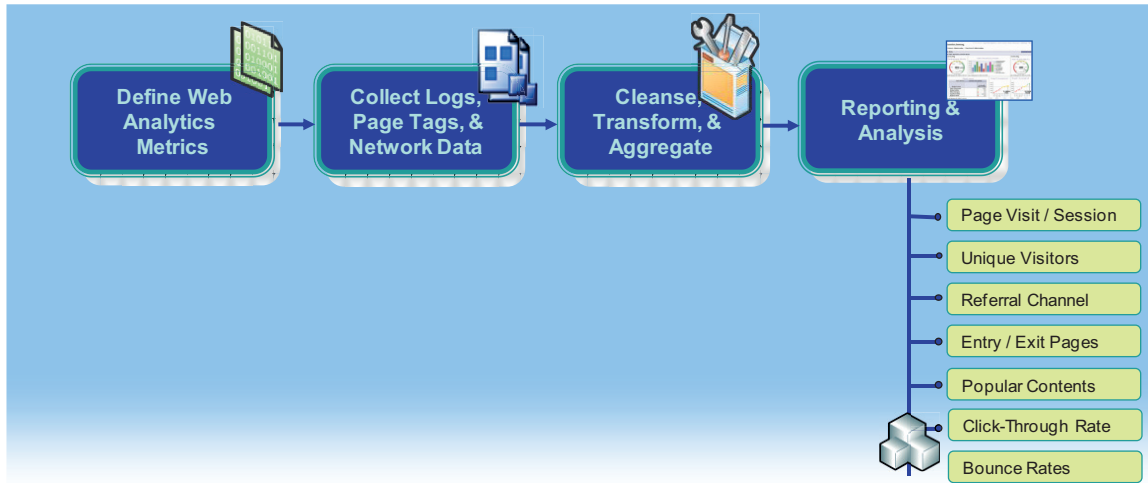


Figure 2: Step by Step Approach to Web Analytics

Process of building Web analytics comprises of the following phases:

- Gather business requirements
- Define factors required to derive the metrics
- Identify required attributes from the log files by placing appropriate page tags for monitoring the visitor navigation
- Capturing network details from the hardware.

The attributes gathered by usage of log files or page tagging are unstructured and therefore, unsuitable for further analysis. This data should be cleansed, de-duplicated (if required), aggregated, standardized and loaded into the data models. Then this dimensional data can be presented for analysis with the help of reporting tool or published in the enterprise portal for management decision.

Web Analytics Architecture

A typical web analytics system comprises of several parts. The above diagram illustrates the architecture of a typical real-time web analytics system.

- Website user accesses the web page through a browser and the server returns the web page to the user.

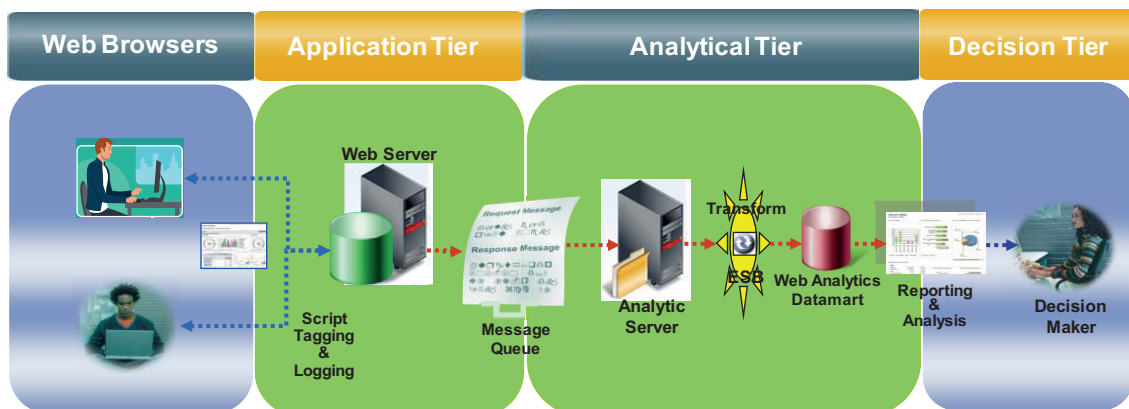


Figure 3: Architecture of Real-Time Web Analytics

- As the web page is loaded the activity is logged in the web server, used in log file analysis, or a separate request is sent to the analytics server, in case of page tagging.
- Once the request is received by the analytics server, it returns a small (1x1 pixel) image to the browser along with a cookie.
- The request logs are processed by the analytics software, cleansed, transformed and loaded into datamart.
- Reports are generated through datamart which are used for decision making.

Conclusion

Today the digital consumer experience is the key driving force behind all business decisions including the enterprise level competition to provide the next generation services for their customers. It has become imperative for the enterprises to understand the customer and their varying behavioral patterns on regular basis and react quickly to meet their expectations. In this context we find that usage of web analytics and prediction plays an important role for enterprises to convert new visitors as customers, delight the existing customers and thereby increase revenue and profitability of an organization. Infosys has rich experience in providing customized web analytics and prediction solutions for different Industry segments by using 3rd Party products, home grown tools, systems and processes.

About the Author

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