

Rationale

It takes much skill, labour, and cost to produce e-learning resources on the web for medical students. But how can one know if the effort was worth it? For a student might score high marks on an exam by using resources other than those we laboured over. And how can one monitor students' e-learning experience in real time, in order to quickly adjust one's teaching strategy while a course is still in progress? Part of the answer to these questions lies in the wealth of data tracked by web statistics tools.

Technical Background

Every time someone accesses a hypertext document (e.g. a web page) over the Internet, the access request is logged by the remote web server to a common log file format stored on the server. This simple act of logging every document request provides the raw data necessary to allow many powerful statistical analysis applications to give one a wealth of information about how, when and where one's content is being accessed or utilized.

The more information one knows about who is accessing one's content and how that content is being consumed, the more that one as a content expert or developer can tailor that content to the needs of the target audience. Knowing how and when to deliver one's content can be a powerful foundation that one can use to develop digital assets further and to explore innovative methods of learning and teaching online.

Web Statistic Analysis Applications

There are many different applications available for analyzing the log files generated from a web server. Some of these applications require one to install them directly on the web server itself and will read the log files automatically; others require one to install them on a personal computer and feed the log file data into them manually. But a newer breed of web analysis applications are completely web based, and this market is now led by Google in the form of Google Analytics.

Server-based Solutions

AwStats and Webalizer are probably the most common web analysis applications available on web servers today. They are both open source, freely available and both provide a great deal of technical information about visitors. These pieces of software generally require installation on the server itself, so that they are able to analyze log files automatically on a daily basis. This means that a server administrator needs to get involved to install the application if they are not currently available.

While these two applications are very good at providing technical information such as total hits and unique accesses, hourly access information, web browser and operating system stats, etc., they do not necessarily provide a very well laid out view of how visitors are using and accessing the content.



Personal Computer-based Solutions

WebTrends is a company that provides many different solutions for any enterprise that requires detailed web analysis. One of their enterprise products, also called WebTrends, is an application that installs directly onto a PC. This software requires manually loading of the raw log files from a web server into the software. Doing so then allows one to manage all reports and report generation frequency from one computer. It also has the ability to generate some very fancy canned reports that are nice and simple to understand for non-technical readers. This is fairly expensive commercial software, but there is a 15-day trial available from their web site.

Web-based Solutions

The era of some types of locally installed software applications is becoming threatened by the advancing technologies in web browsing software and by companies or organisations that are willing to spend the time to develop web applications which are as powerful and fast as their locally installed competitors. One of the major benefits of web based applications is that they are always accessible from any computer, anywhere in the world, with an Internet connection.

This benefit is especially popular when one is trying to analyze statistics gathered from web servers, because no matter what time of day it is or where one is, one can always check on the status of traffic on one's sites and applications. This brings us to Google Analytics.

Google Analytics is still in a limited release mode, so it is not yet available to everyone. However, once your account is activated on Google's servers, you can remotely track web statistics for up to 5 domain names or web applications.



Adding a web site for Analytics to track is simple, Google requires only the domain name that one wishes to gather statistics for and a small snippet of JavaScript code on any page of content that needs to be tracked.

```
<script src="http://www.google-analytics.com/urchin.js" type="text/javascript">
</script>
<script language="JavaScript" type="text/javascript">
_uacct="UA-xxxx-x"; // Your Google Tracking ID
urchinTracker();
</script>
```

This small snippet of code provides Google's analysis engine with all the information it requires to analyze and to report some of the most advanced statistics and visitor patterns available. Google Analytics can track all of the same pieces of information that other analysis tools can and more. One can then log into Google Analytics over the Internet using a web-browser, without installing anything on one's computer or server. This is all provided at no cost from Google.

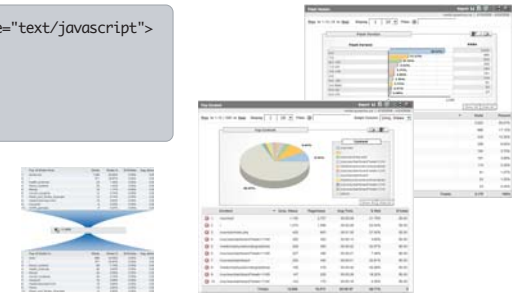
How Could You Use Google Analytics?

Imagine that you have a course website, research site, or some type of electronic document on the Internet that you wish to track and to analyze.

Even if your website is built into a learning management system (LMS) or if you already have access to a web statistics analysis application, Google Analytics is still a valuable, no-cost tool that you can use to cross-reference results from those applications or to obtain many pieces of information that are simply not available from other analysis applications or from a LMS.

Google Analytics can answer many questions, such as:

- ▶ Are students actually accessing my e-learning resources?
- ▶ Are they actually downloading the readings before class, as I had asked?
- ▶ Which of my resources are most or least popular? That is, have my latest efforts had the desired impact?
- ▶ Are students revisiting resources for review purposes, such as before exams or perhaps even after a course has ended?
- ▶ What types of web browsers and operating systems are learners using to access my content?
- ▶ What are the most common screen resolutions or colour depths being used by my students? That is, are my resources optimized for my students?
- ▶ Do students have Flash or Java installed already and, if so, which versions? That is, can they access this resource?
- ▶ What percentage of students have hi-speed Internet access? That is, are there students on slower dial-up connections who cannot view certain videos?
- ▶ Are students actually spending some quality time on my website, or just poking around quickly?
- ▶ How does "Learning Object A" or "Page A" compare to "Learning Object B" or "Page B" in regards to all of this information?
- ▶ Is everyone who is accessing my content from my school, or are there viewers from other cities, provinces or countries?
- ▶ How are people reaching my content? For example, if they use a search engine like Google, what key words are they entering?



By asking questions like these, one can begin to understand how one's e-learning content is being accessed and by whom. One can then adjust and develop the content to better suit the needs of the people who are actually viewing it.

There are other methods of finding out similar information, such as polling learners through surveys or feedback forms, but no other method allows the collection of this detail of information in real time without any effort from learners. There are also very few privacy concerns in regards to analyzing web statistics, because the information gathered by Google Analytics is generally anonymous (there are no names attached) and because the logging of this type of information is done already by nearly every website on the Internet. Nevertheless, we would recommend making available a simple privacy policy, which is easy to write and will usually satisfy the most privacy sensitive of visitors.

Conclusion

A skillful analysis of web statistics helps instructors, educators, and developers to understand their learners and the effect of their e-learning interventions in real time. This insight can provide valuable feedback for continuously improving the quality of learning and teaching. The latest web-based statistics applications are especially promising.

For more information about web statistic analysis please visit the MedTech website at <http://meds.queensu.ca/medtech>.

