

# THE ART & SCIENCE OF WEB ANALYTICS

...BECAUSE PROFESSIONALS NEVER GUESS!

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*Anyone who spends time managing a business becomes intimately familiar with Murphy's Law: If anything can go wrong, it will.*

In 1949, Captain Edward A. Murphy formulated this now-famous "law" at Edwards Air Force Base while working on a series of experiments to determine how much sudden deceleration a human body might withstand during an airplane crash. One day, while cursing a technician for improperly wiring a transducer, Murphy said, "If there's a way to do it wrong, he'll find it." The defense contractor company, who kept a list of laws for the project, added it to the list as Murphy's Law—and later attributed the firm's outstanding safety record to its consistent application.

If we were to extrapolate Murphy's Law and apply it to your website, it might go something like this: If anything can go wrong along the visitor's path from clicking your ad to traversing your website to purchasing or opting-in, it will.

In short, if there's a way to do it wrong, they'll find it! Search engines will send you the wrong prospects. Prospects will find unexpected reasons to leave your site or otherwise fail to take action and do business with you. Credit card payment processors will crash at the most inopportune times. The list of variables (i.e., whatever can go wrong) is long. Stuff happens. Yet, the road to profits runs along the avenue of understanding those variables that can upset your online profit model. Pinpointing such upsets—quickly—is the only way you can consistently respond in time with adjustments to fend off disaster while you keep the profits steady.

So, what's your first line of defense against nasty surprises ruining your ecommerce day (week, month, or year)? Answer: web analytics!

## WHAT IS WEB ANALYTICS?

Suppose I told you that web analytics is a method of learning about your online business function by applying the principles of the scientific method—which includes making empirical observations—proposing hypotheses to explain those observations and testing those hypotheses in valid and reliable ways. That would make it sound hard, wouldn't it? But the truth is, it's not so hard. In fact, it's simply a way to identify problems as, or before, they develop and consistently improve all aspects of your online business function. It's a skill you

can learn by study, practice, and observation. And, here's where you'll learn to apply it to your online business in ways that can help your profits exponentially soar! In this article we will...

- Examine the importance of leadership, change management, and vendor relationship. These are the prerequisites for a successful web analytics deployment.
- Present a hypothetical business case and show how to calculate the return on your web analytics investment.
- Review the basics of tracking and web metrics calculations and compare the techniques used in web measurement and data collection.
- Help you avoid the pitfalls and errors commonly encountered in web analytics deployment.

In short, you're about to learn how to build defenses against Murphy's Law.

## SUCCESSFUL WEB ANALYTICS BEGINS WITH STRONG LEADERSHIP

You might be surprised to learn that leadership—having someone to grab the reigns of initiative—is the keynote to successfully deploying a functional web analytics package. Because various functions that comprise your online business (such as marketing, information technology, web design, sales, customer service, support, order fulfillment, etc.) are often carried out by different management teams (both outsourced and within your organization), any successful web analytics program depends on strong leadership that's able to intelligently guide and coordinate these various functions.

Jupiter Research estimates that over 60% of online businesses don't have a dedicated web analytics person on staff. That's equivalent to fighting a battle without a general. Before you do anything else, you'd be wise to empower a knowledgeable and qualified person to be in charge of your web analytics program. Whenever affordability allows, it's always best to hire a dedicated staffer. At the very least, you should select someone from within your organization and train them to do the job. It's hard to imagine any scenario where the profit rewards of a functioning web analytics program would not easily offset the additional payroll-cost of a trained and dedicated staffer. The most important quality of a web analytics

leader is their ability to empower team managers to act. Take a breath and reflect on this for a moment—this is probably the biggest issue facing the web analytics challenge. Far too often we've seen cases where companies have the systems in place, along with measured results, but lack a functional chain-of-command that compels action. The best web analytics reports in the world are 100% worthless if team managers aren't compelled to act on the information they collect.

## CONTINUOUS IMPROVEMENT & CHANGE MANAGEMENT

If there's one thing constant about the Internet, it's the state of constant change. Many online businesses are just one glitch away from ruin. Technology, along with customer preferences, changes every day. Ask yourself,

"What if Microsoft's new browser renders a part of my site unviewable? ...or my shopping cart non-functional?" Would you know right away? That answer alone tells you why managing, monitoring, and testing is paramount to online success. Any successful web analytics program, therefore, begins with establishing the processes of continuous improvement and change management.

Continuous improvement (CI) is a quality philosophy that assumes further improvements are always possible and there's no limit to perfection. Think of it as Murphy's Law in reverse—If something can be made better, we'll do it!

Change management (CM) is a set of internal procedures that alert managers to changes—good and bad, internal and external—and directs them in planning and decision making.

Let's consider a sadly typical example: Picture a company spending \$1,000 per day on pay-per-click advertising red widgets. In the beginning they're averaging \$5,000 per day in sales. Then, slowly, the daily revenue drops to below \$3,000—and they haven't a clue why their sales have dropped.

Of course, the answer is knowable, but they haven't the means to examine every step along the way through the conversion process. As they sit, paralyzed by not knowing how to proceed, they're losing \$2,000 or more per day.

Is it a statistical deviation? Could click fraud be the culprit? Did someone in marketing

“improve” the sales copy on the landing page? Did the site begin loading too slowly? Is there a technical glitch with a shopping cart? Has the credit card processing service become unreliable for any one of a number of reasons (like a hacker attack)? Are competitors running a special offer on red widgets? Heck, do they even know if \$5,000 in daily red widgets sales is a good figure in the first place?

In most cases, the sad truth is that they don't know the answer to any of these questions. They, like many companies who operate online, were succeeding in spite of themselves. And, now that the gravy train is pulling out of the station, they simply don't know how to proceed. This is exactly how so many businesses that start out strong fade away in the night without ever knowing what happened to their once thriving business model.

Don't let that be YOUR story!

This example should teach us that the process of improvement must not only be continuous, but also comprehensive and proactive. Why? ...because it's change itself that presents the bulk of our opportunities!

## IMPLEMENTING CI AND CM

There are many ways to implement continuous improvement and change management. One is a proven method pioneered by my own company, Clicklab, which we call ESA/T—this stands for Enhance. Select. Analyze. / Test. Inspired by an established management practice known as Total Quality Management (TQM), but adapted specifically for the needs of online businesses, the four-phase ESA/T cycle seeks to continually improve the quality of relevant processes by making refinements based on the feedback gathered from web analytics data. (A free report detailing the inner workings of ESA/T can be accessed at [clicklab.com](http://clicklab.com).)

ESA/T works like this:

- **Enhance** the visitor's experience of your web site.
- **Select** traffic sources and marketing strategies.
- **Analyze** your results using key performance indicators. In other words, predict future behavior by examining past behavior.
- **Test and tweak** to improve the outcome of E and S.

These four steps can be repeated over and over in an ascending spiral towards continuously optimizing your profit performance.

## SELECTING THE RIGHT VENDOR

The third key ingredient in implementing successful web analytics is finding the right vendor.

Now that you understand the importance of having a capable web analytics leader to oversee the processes of continuous improvement and change management, it's time to logistically fit your web analytics vendor smoothly into your online business operation. Here's a checklist of items generally associated with tracking requirements that you should consider in your vendor selection process.

**Quality over quantity.** There's nice-to-know and need-to-know information. The first one can be a real time-waster; the latter a profit-maker. Too often vendors try to dazzle based on the number of reports they provide. Frankly, this can be an unwelcomed obstacle to getting the facts you need—too much information clutter. Sure, it may be nice to know screen resolutions and which browsers your visitors are using, but at some point you must ask yourself where such information ranks on your list of priorities. Reports such as average revenue per first-time vs. repeat customer talk about the money. The professional marketers we know are far more interested in the money reports than in the nice-to-know techie related reports. Be sure to also consider the amount of manual work (as in, say, Excel using exported data) that may be required to generate any need-to-know money related reports not provided by your vendor. The less, the better. Ideally, your vendor should provide you with all of the money reports you need without you having to do any extra work.

**Click fraud detection.** Click fraud—the premeditated practice of clicking on pay-per-click (PPC) ads without any intent to buy, can seriously undermine your marketing efforts. Proper click fraud detection requires the collection of a full set of web analytics data. The best way to defend against click fraud is to coordinate your web analytics with click fraud detection and auditing services under one roof. To hire two different services for these functions is generally more expensive and less productive. It's simply a case where the right hand must be coordinated with the left hand to maximize efficiency.

**Drill down capabilities.** You'll want to have the ability to “slice and dice” the data. For example, compare average revenue per visitor generated by visitors originating from Google AdWords vs. MSN organic search results and entered your site via a specific landing page vs. another.

**Checkout process tracking.** You must be able to track visitors each step along the way to your checkout process. This includes adding items to cart to the thank you page following a successful order. Particularly useful is knowing your drop-off rates in the funnel and identifying problem areas and exit points.

**Conversion tracking.** You'll need the ability to specify certain pages viewed or actions taken by visitors on your website as conversions. These should be measured by each individual traffic source and keyword. Good examples of conversion measurement would be a tally of completed inquiry forms (i.e., new leads), newsletter subscriptions, information requests, file downloads, and so on.

**Data management (for ASP-type solutions).** Be clear about who owns the data collected on your behalf. You'll want to know what happens if you switch vendors sometime down the line. Will you be able to take your data with you? What issues might exist should you want to export all historic account activity into XML or Excel? Ideally, your data should be portable and easily exported into common spreadsheet programs for analysis.

**Support and professional services.** You should settle in advance the costs of support and establish guaranteed turn-around times. There may be additional costs for phone support and, if so, this should be factored into your overall decisions. Naturally, you would expect the vendor to have competent web analytics specialists on staff who can provide professional services such as web analytics deployment consulting or website usability improvement services—but, regardless, you should check to ensure such support is available should you need it. And, determine beforehand what costs (if any) you should expect to incur.

**Product and vendor dynamics.** Because technology, industry practices, and even business goals change over time, it's smart to evaluate the prospective vendor's ability to stay abreast of the industry trends while adapting to rapidly changing, competitive landscapes. Clues to their ability to endure for the long haul can sometimes be found in their current longevity. And, don't be afraid to ask for references...and then follow up and check those references.

## HOW MUCH SHOULD YOU PAY FOR WEB ANALYTICS?

First, be realistic. Bear in mind that the price of anything business related is determined by the value of the time it saves, the income it produces, and the expenses (including click-fraud) it eliminates or curtails. All three of these factors must always be considered when determining overall cost.

For instance, in the red widget example used above, if a web analytics service elevated the company's revenues back to the \$5000 per day level (giving them an extra \$2000 per day / \$60,000 a month), then even a \$10,000/month fee might seem a reasonable price to pay. As

you can see, it's all relative to what you stand to gain by doing it right.

Based on your own individual business model, you must manage your expectations based on what fits. Do you want enterprise-level features such as a toll-free telephone line manned 24/7 by web analytics specialists? ...if yes, then you should expect to pay an enterprise-level price. Or, you may find that a web-based support system with 72-hour turnaround time is sufficient—that will save you substantially in fees.

Is it worth it for you to pay \$5,000 for a day of on-site training? ...or would you rather brush up on the matters of web analytics and conversion tracking yourself? Whatever price quotes you get, be sure they include details and costs of support and professional consulting services. If you're unfamiliar with the meanings of certain metrics, or how to interpret the data, you'll want to pre-include support within the package or else set an hourly consultation fee to cover the gaps in your own expertise. That's the best way to ensure that you can get up to speed on what you (or your staff) need to learn.

These are the details you'll want to get clarified up front—before you sign on the dotted line. Also, take care that the package makes economic sense for the vendor. It's never to your advantage to be an unprofitable customer. It's simple to see that, if your deal is too good to be true for you, then the vendor will stop working hard on your behalf for lack of incentive.

To keep price in perspective, always frame it in the context of your overall business. Establishing a comprehensive web analytics program is quite arguably the most important investment you can make in your online business. To know for certain you must evaluate the Return on Investment (ROI) potential rather than just the face value of projected monthly cost.

Purely on face value, one might think that \$500 per month (or under \$20 per day) is a lot. However, we've already seen how returning our red widget company's sales back to \$5,000 from \$3,000 per day (that's a \$60,000 increase per month) makes \$500 a month look like the bargain of the century! You'll certainly want to evaluate the **whole picture when you make your decisions**.

## HOW TO CALCULATE ROI IN WEB ANALYTICS

Fire up your Excel — we're going to show you how to calculate ROI in your web analytics investment—and I think you're going to like the results. (Please note: we're referring here to investment in your web analytics—not in PPC advertising or other components of your digital marketing.)

There are two key components that contribute to increased cash flow:

**The direct increase** in sales resulting from increased conversions due to improved traffic quality and website usability.

**The savings** resulting from discontinuing non-performing advertisement and detecting click fraud.

Plugging these two variable factors into your spread sheet will allow you to estimate the incremental cash flow you can expect from a consistently applied web analytics program.

Next we'll define ROI in Web Analytics as the ratio of incremental gains to incremental cost, usually expressed as percentage:

### ROI = (Gains - Costs)/Costs

To simplify, let's consider the following hypothetical example. And, remember, you can easily change the numbers and see how your potential ROI also changes based on your hypothetical assumptions.

#### Site information

A: Monthly sales (\$100,000)

B: Monthly ad budget (\$15,000)

#### Sales increase resulting from improved...

C: Traffic quality (2%)

D: Website usability (2%)

#### Savings resulting from...

E: Discontinuing non-performing ads (10%)

F: Detecting click fraud (10%)

#### Web analytics solution cost

G: Monthly investment (\$1,000)

$$ROI = (A*(C+D) + B*(E+F) - G)/G$$

$$ROI = (\$100,000*(0.02 + 0.02) + \$15,000*(0.10 + 0.10) - \$1,000)/\$1,000 = (\$2,000 + \$1,500 - \$1,000)/\$1,000 = 600\%$$

As you can see, we used rather conservative estimates for the improvements that you can reasonably expect from a consistent web analytics deployment. In addition, chances are that your monthly web analytics cost will be much lower. Cut your web analytics cost in half—from \$1,000 to \$500—and your ROI will be a whopping 1,300% (that's not to say that 600% was bad!)

You don't have to wear rose-colored-glasses to see that web analytics is one investment that's well worth the time, effort, and money. To play with your own numbers, or to create a

neat ROI presentation for your boss, feel free to download our handy ROI worksheet for Microsoft Excel.

## INTRODUCTION TO WEB METRICS

Let's start with the mechanics of tracking. HTTP (Hypertext Transfer Protocol) is the system the Internet uses to transfer files and information on the web. Whenever you open your browser and either type in an address or click a link, you're using HTTP. The destination server receives your request, assembles the necessary files, and sends them back to your browser, all while recording the transaction details (more on that later).

These transaction details are the primary metrics available for analysis. Because the standards for web logging were established years ago, the primary metrics will be the same regardless of the application used. Some of them include visitor's IP address, Browser, Operating System, Referring URL — that of the page which contained the link followed by a visitor to arrive on your website, Name of the file that is being requested. These primary metrics are then used to calculate more useful and actionable derivative metrics. As web analytics matures as an industry (it still has a long way to go), certain assumptions, definitions, and de facto standards for calculating derivative metrics begin to emerge. Some vendors will even let you define your own criteria to be used in calculations. Here are a few examples of these second-tier metrics: Pageviews, Visitor, Unique Visitor, Returning Visitor, Visitor Session (or Visit), Referring URL grouping (i.e., Google organic, Google Ad Words — both native search results and content syndication), Actions, Conversions, Loyalty, Frequency, Recency.

Website metrics are the building blocks of key performance indicators (KPIs), which are the driving force of the continuous improvement and change management processes.

## LOG FILE ANALYSIS VS. PAGE TAGGING

There are two principal ways in which data required for web analytics can be collected: Log file analysis and page tagging. Software for log file analysis has been around since the beginning of internet-time when it was the only tool available for generating web traffic reports. As the name implies, log file analysis software processes the text log files that web servers write after serving HTML pages and other objects such as images. Page tagging refers to the insertion of a special code into HTML of every web page that you want to track. This method has been rapidly growing in popularity in recent years.

Both techniques have their inherent strengths and weaknesses that are the subject of perpetual debate within the ecommerce market-

ing industry. Your choice will depend on your particular situation, resources, and requirements for tracking. While ultimately it's your web analytics coordinator who should call the shots, we can help you summarize the key pros and cons of both techniques.

**Business model.** Log file analysis software is downloaded, installed, and configured on a dedicated server or your desktop machine. Page tagging software is offered on a hosted, or outsourced (ASP) basis—meaning there is no software to download or install. Reports are generated on the provider's servers and are accessible around the clock via a web interface.

**Cost of ownership.** There are up front costs associated with log analysis software. The cost of log analysis web analytics is not dependent on your website traffic and, aside from the optional upgrade fees, there is little or no recurring cost. In contrast, page tagging sports a recurring monthly fee which depends on the volume of traffic your website generates. The service provider gathers, processes and stores your statistics on their servers.

**Initial implementation.** After log analysis software is installed, there is typically little or no additional configuration required. Page tagging, on the other hand, requires that you insert the tracking codes into every page that you wish to track. Most modern sites have common header and footer files that are shared by all HTML pages of the site. If that's the case, there aren't too many issues with the installation of a page tagging solution, either.

**Ongoing management.** Log files, depending on your site traffic, can grow very large in size, creating problems with disk space, file transfer, storage, and archiving. With page tagging however, these headaches do not exist because all action takes place on the provider's servers.

**Flexibility.** Unlike log files, which can gather only a preset collection of data, page tagging solutions allow you to define additional information about the visitor session or type of content and pages that are being viewed, directly within the HTML pages of your website. This enables you to designate specific pages as actions or conversions—and makes it much easier to set up measurements of various website processes.

**Accuracy.** Web analytics is an imprecise science. Factors such as proxy servers, browser caching, lost connections, deleted cookies, large number of users sharing the same IP address (AOL is the most notorious example), indexing robots and many other issues make

it virtually impossible to ever know the complete truth about your website traffic regardless of the type of solution you use. The best you can hope for is relative accuracy—comparative figures based on previous statistical measurements.

### PITFALLS TO AVOID

Always remember that web analytics is an imprecise science—part art, part science. That's why it's not a good idea to focus on the raw numbers. Crunching the raw numbers isn't as important as interpreting the changes in those numbers—and that's where the art comes in. Even if your analytics are underreporting due to AOL proxy servers or other inexact factors, they will consistently underreport every day so observing the tendencies rather than the numbers will give you a valid indication of how successful the results of your work are.

For the web analytics process to be as scientific as possible, use the following tips:

**Stick to your metrics.** It's important to set up measurement criteria and key performance indicators up front and avoid changing the tactics mid-stream. Otherwise, you'll lose sight of what you're really looking at.

**Make sure you're using statistically valid data samples.** If you had 100 visitors and 1 order, does that mean your conversion rate is 1%? The short answer is no. However, you can be reasonably sure that if 100,000 visitors generated 1,000 orders, your conversion rate is, indeed, very close to 1%. The larger number of visitors and orders gives you a more statistically valid conversion percentage.

**Don't change two or more elements at once.** It may seem quicker in the beginning but the results will defy interpretation because you can't know how multiple changes contributed to the overall effect. Change one thing at a time. Test. Then change another. Test again.

**Use A/B testing for any changes that you make.** This type of testing refers to randomly splitting your audience into two groups, then sending one group to the original version of the element of the site that is being tested and another to the modified version of it. Test. Test. Test.

For further reading, I'd like to refer you to a book written by web analytics evangelist extraordinaire Eric T. Peterson of Jupiter Research. It's aptly titled "Web Analytics Demystified." This book has already become a de facto standard on the subject. Do yourself a favor and order a copy in print or PDF format from [www.webanalyticsdemystified.com](http://www.webanalyticsdemystified.com).

In summary...

You undoubtedly now have a much clearer view of how web analytics really is part art, part science. Remember, it begins with a dedicated leader who is empowered to synchronize the efforts of your website team managers and compel them to act on the information they receive. A successful web analytics deployment depends on the processes of continuous improvement and change management as well as a good working relationship with the right vendor who will make, and save, you much more money than whatever fee they charge.

Online companies that embraced these concepts are the ones we see reaping the almost unlimited rewards of ecommerce at their highest levels.

Measure everything,  
Dmitri Eroshenko, CEO of Clicklab



*Editor's note: Dmitri Eroshenko is CEO of Clicklab ([www.clicklab.com](http://www.clicklab.com)), a leading web analytics service with custom Key Performance Indicators (KPIs), click fraud detection, and usability testing tools geared to improve your online marketing ROI and conversion rates.*

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