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BRIAN CLIFTON

Foreword by **Jim Sterne**, Founder of the eMetrics Marketing Optimization Summit and Chairman of the Web Analytics Association

Advanced Web Metrics with Google Analytics™

THIRD EDITION



SERIOUS SKILLS.

Praise for *Advanced Web Metrics with Google Analytics, Third Edition*

“It would be a cliché to say Brian Clifton knows Google Analytics like the back of his hand. But he does. So if there is only one book you can buy on Google Analytics... buy this book and you’ll be on your way to being an Analysis Ninja!”

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—ASHLEY FRIEDLEIN, CEO, Econsultancy, Econsultancy.com

Advanced Web Metrics with Google AnalyticsTM

Third Edition

Brian Clifton



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Best regards,

A handwritten signature in black ink, appearing to read 'Neil Edde', with a stylized, flowing script.

Neil Edde
Vice President and Publisher
Sybex, an imprint of Wiley

“Web analytics is the study of the online visitor experience in order to improve it.”

—THE AUTHOR, circa 2007

“Advanced web metrics is about doing the basics very well and applying it in a clever way.”

—SARA ANDERSSON, CEO, Search Integration AB



Acknowledgments

After the first two editions of this book, writing this third edition has been both very rewarding and very hard work. Thankfully, my writing style has much improved—mainly due to the valuable feedback I have received from readers, clients, and workshop attendees alike. This has enabled me to produce this third edition not only with the latest features and updates from Google Analytics, but also in an improved pedagogical manner. I hope you consider it a worthy enhancement.

I have never considered myself a natural writer. Endlessly agonizing over every sentence, I would yearn for perfection, or at the very least adequacy. The first edition of this book, written while working 12 hours a day at Google, took me 18 months to finish (mainly written on trains and planes or in various hotel rooms across Europe or in the United States). I got myself organized and even more obsessive (if that were possible) and completed the second edition in six months. For the third edition, I am down to five months—to the relief of my much-supportive partner, Sara, and my friends and family.

Yet the process of writing remains enjoyable. In fact, I am already looking forward to my next writing project, though I am undecided as to what that should be—I said that in the last edition! However, I am not a one-man band, and many people have happily contributed their time to make this edition even better than the previous editions.

First, special thanks go to Trevor Claiborne, Brad Townsend, Alex Ortiz-Rosado, Nick Michailovski, and Tomas Remotigue, all of Google, who have significantly contributed to my knowledge and understanding of the internal workings of Google Analytics over the years. All worked in their own time to sanity-check and expand on the technical aspects of this and previous editions of this book. Trevor is my much-appreciated technical editor. His eagle eye for detail and breadth of knowledge for all things Google have enabled me to write a much more comprehensive book.

Significant feedback, help, and brainstorming were also freely provided by Shelby Thayer, a web analytics practitioner, enthusiast, advocate, and all-round nice person working for Penn State University. As with the last edition, Shelby has kindly proofread and commented on *every* page of this book, ensuring content relevance and continuity. Her informed questions and detailed feedback have been invaluable to me.

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the foreword; Mikael Thuneberg (automateanalytics.com), John Babb ([idemension](http://idemension.com)), James Bake (Hanson Inc.), Henrik Lauritzen (UserReport), and Paul Walsh (Infinity Tracking Ltd.) for providing case study content to include with Chapter 12; and all members of the Google Analytics Certified Partners (GACP) network for their stimulating discussions, experiences, and thoughts when implementing and using Google Analytics for their clients.

Last but not least, many thanks to the Wiley publishing team: Willem Knibbe, whose enthusiasm for this topic keeps me wanting to produce further editions of this book; Dick Margulis, who originally helped me with the first edition and kept the structure and cohesion going in a straight line throughout the process of writing this edition; Pete Gaughan, Liz Britten, Judy Flynn, and the many other people at Wiley who work tirelessly in the background to help create and polish what I hope you will consider is an enjoyable and informative read. Ultimately this was my mission for what potentially can be a very dry subject.

That's quite a long list, with people from all over the world (at least seven countries) helping to shape, expand, and improve the content provided. I hope I have remembered everyone.

About the Author

Brian Clifton, PhD, is an internationally recognized Google Analytics expert who consults on website performance optimization for global clients. Coming from a web development and search engine optimization (SEO) background, he has worked in these fields since 1997. His business was the first UK partner for Urchin Software Inc., the company that later became Google Analytics.

In 2005, Brian joined Google Europe. As former head of web analytics for Google Europe, Middle East, and Africa, he defined the strategy for adoption and built a team of pan-European product specialists. He is now Director of Data Insights and Analytics at Search Integration AB.

Brian received a BSc in chemistry from the University of Bristol in 1991 and a PhD in physical and theoretical chemistry in 1996. Further work as a postdoctoral researcher culminated in publishing several scientific papers in journals, including *Molecular Physics*, *Colloids and Surfaces*, and *Langmuir*. During that time, he was also an international weightlifter, representing Great Britain at world and European championships.

Studying science at university during the early nineties meant witnessing the incredible beginnings of the Web. In 1991, Tim Berners-Lee, a scientist working at the CERN laboratory in Switzerland, launched the first web browser and web server to the academic community, thereby sowing the first seeds of the World Wide Web.

Although the communication potential of the Web was immediately clear to Brian, it took a little while for ideas to formulate around business opportunities. In 1997 he left academia to found Omega Digital Media, a UK company specializing in the provision of professional services to organizations wishing to utilize the new digital medium.

Since leaving the field of chemical research (and weightlifting), Brian has continued to write—on his blog, Measuring Success (www.advanced-web-metrics.com/blog); as a guest writer on industry forums, and via white papers.

Brian holds the title of associate instructor at the University of British Columbia for his contribution to teaching modules in support of the Award of Achievement in Web Analytics. You can also hear him speak at numerous conferences around the world, where he discusses data-driven online strategies and site optimization. Brian was born in Manchester, United Kingdom, and now lives in Sweden.

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Foreword

In 1990, the first web server hosted the first website at <http://info.cern.ch>. Tim Berners-Lee, a physicist at the European Organization for Nuclear Research, thought it might be a good idea. Turns out he was right.

As a transactional system, the web server was built with a logging capability that was a standard method for stockpiling details should everything go belly up.

It didn't take long for the data in these log files to attract the attention of those trying to make the systems work better. The first question, asked by webmasters like Tim, was whether the server was robust enough and the connection to the Internet was fast enough to keep up with demand. It was a technical challenge.

Eventually, the marketing department became aware that the geeks and nerds in the IT department were running the equivalent of electronic brochures on something called the World Wide Web. These marketing people were interested in system performance as well. But for them, it was not a technical matter but a question of customer experience.

Next, the marketing department wanted to know how many potential customers visited their websites every day. What did they do there? How deep did they dig? How often did they come back? How economical was the process of attracting them to the site?

As these questions became more and more complex, tool vendors bubbled up out of academia, the IT industry, and keyboards of those trying to answer their own questions using GREP and PERL.

Concurrently, a postdoctoral researcher at the University of Bristol was publishing completely unassociated papers like "Simulation of liquid benzene between two graphite surfaces," "The adsorption of tri-block copolymers at the solid-liquid and liquid-liquid interfaces," and "Calculation of Silberberg's polymer segmental adsorption energy by a free space molecular modeling technique." Brian Clifton did not know it at the time, but these papers turned out to be just the sort of education required for delving into what would be known as web analytics.

It takes the same combination of deep technical understanding and inclusive, lateral creativity to come up with different ways to look at data. It doesn't matter if you are creating "Methods for calculating solvent enthalpy of vaporization values by a molecular modeling technique" or trying to model human web surfing and buying behavior.

This mixture of left brain and right brain thinking is essential for modern marketing.

We will always need wildly imaginative, massively artistic, and enormously intuitive advertising "creatives." But the smooth, sophisticated, and slightly jaded Mad Men

who have ruled on gut feeling and intuition have been joined by the geeks and nerds in the marketing analytics department. These are the people who can verify that those brilliant ideas are brilliant in the eyes of the public as well as in the eyes of the award presenters.

What's required is that magic mixture of technological smarts (where do these data come from?), psychological acumen (why do people act that way?), marketing mastery (how can we communicate our point more poignantly?), and analytics ingenuity (what if we looked at it from a different angle?).

This is where Brian Clifton stepped into the picture. He offered consulting services to companies that were struggling with the concept of online marketing. He realized that the best way to communicate with his clients was to show them the numbers. If they followed his advice, they could see an increase in brand recognition, purchase intent, prospect engagement, revenue, and customer satisfaction in black and white.

To make all of this as clear as possible, Brian became an expert with one of the best tools on the market, a web analytics tool that was so valuable, Google bought it. Recognizing that tools alone do not build empires, Google hired Brian to represent the product in Europe, the Middle East, and Asia.

In this tome, Brian does more than simply unmask the technical particulars of Google Analytics. He also stays steadfastly practical. He, yes, walks you through the nuts and bolts of Google Analytics, but always with an eye on its usefulness. He doesn't just show you how the internal combustion engine works, he explains how to drive the car and then—perhaps most important of all—how to navigate in order to get to your desired destination.

You are lucky to have this book in your hands. If you are new to the idea of online marketing metrics, there is no better way to get started. If you've been around web analytics for a long time, even if you have read Brian's previous two editions, it is worth your while to dig into this one as well.

Think of this book as a refresher course with some new surprises thrown in. Google Analytics is constantly changing, and Brian clarifies how to harness the new powers Google has incorporated into the latest versions.

I am honored to join those who have penned forewords to Brian's previous editions: Chris Sherman, executive editor at Search Engine Land, partner at Third Door Media, and search expert extraordinaire; and Avinash Kaushik, digital marketing evangelist at Google, cofounder at Market Motive, author of *Web Analytics: An Hour A Day* and *Web Analytics 2.0*, and the most fervent advocate of the marketing analytics industry.

I am pleased to add my voice to the chorus of praise for Brian Clifton, his talents in the web analytics arena, and this resulting edition of *Advanced Web Metrics with Google Analytics*.

—JIM STERNE

Founder of the eMetrics Marketing Optimization Summit
Chairman of the Web Analytics Association

Introduction

Although the birth of the Web took place in August 1991, it did not become commercial until around 1995. In those early days, it was kind of fun to have a spinning logo, a few pictures, and your contact details as the basis of your online presence. My first website was just that—no more than my curriculum vitae online at the University of Bristol. Then companies decided to copy (or worse, scan) their paper catalogs and brochures and simply dump these on their websites. This was a step forward in providing more content, but the user experience was poor to say the least, and no one was really measuring conversions. The most anyone kept track of was hits, which nobody ever really understood, though they were assumed (incorrectly) to be visits.

Around the year 2000, and propelled by the dot-com boom, people suddenly seemed to realize the potential of the Web as a useful medium to find information; the number of visitors using it grew rapidly. Organizations started to think about fundamental questions such as, “*What is the purpose of having a website?*” and considered how to build relevant content for their online presence. With that, user experience improved. Then, when widespread broadband adoption began, those organizations wanted to attract the huge audience that was now online, hence the reason for the rapid growth in search engine marketing that followed.

Now, with businesses accepting the growing importance of their online presence, they are prepared to invest. But how much money and what resources should an organization put into this? What are the pain points for a visitor that stop them from transitioning from an anonymous visitor to a new lead or new customer? What is the most cost-efficient way to market the site, which channels produce the most valuable leads, and can we predict the return on investment for the next campaign?

Answering such questions requires data and hence a measurement tool. Put simply, this is what web analytics tools, such as Google Analytics, allow you to do—study the online experience in order to improve it.

But what can be measured, how accurate is this, and with the plethora of data, which are the important metrics? In other words, how do you measure success? Using best practice principles I have gained as a professional practitioner, this book uses real-world examples that clearly demonstrate how to manage Google Analytics. These include

not only installation and configuration guides but also how to turn data into information that enables you to understand and benchmark your website visitors' experience. With this understanding, you can then build business action items to drive improvements in visitor acquisition (both online and offline), conversion rates, repeat visit rates, customer retention, and ultimately your bottom line.

Who Should Read This Book

As a great friend and mentor to me once said, "Advanced web metrics is about doing the basics very well and applying it in a clever way." I wish I had thought of that phrase! It epitomizes everything about my approach to web analytics and this book. Thus, I have attempted to make this book's subject matter accessible to a broad spectrum of readers—essentially anyone with a business interest in making their website work better. After all, the concept of measuring success is a universal desire.

The content is not aimed at the complete web novice, nor is it aimed at engineers—I am not one myself. Installing, configuring, or using Google Analytics does not require the knowledge of an engineer! Rather, I hope that *Advanced Web Metrics with Google Analytics* will appeal to existing users of business data as well as readers new to the field of web measurement.

As the title implies, this book is intended for people who want to go beyond the basics of simply counting hits. These can be grouped into three types of users:

Marketers These are users who have experience with search engine marketing (paid and organic search), email marketing, social search, PR, and affiliate management but have not yet managed to find a unified measurement tool to compare these side by side. If you are in this group, focus your reading efforts on Chapters 1 to 5 and then Chapters 10 to 12 because these are nontechnical and do not require a technical knowledge of the implementation.

Webmasters These are experienced website builders who have the skill set and authorization to modify a website. For this group of users, the book offers sections and exercises that require you to modify your web page content; after all, web analytics is all about instigating change using reliable metrics as your guide. Therefore, knowledge of HTML (the ability to read browser source code) and experience with JavaScript are required. If you fall within this group, the book's entire content is for you. The technical implementation parts are contained in Chapters 6 through 9.

Senior managers These are decision makers who require guidance on preparing a data-driven strategy and action plan for their organization. I hope to supply these readers with an understanding of what can and cannot be achieved with web analytics and specifically provide information they need to plan the resources and timelines required for building an effective web measurement strategy. My aim for this group is to provide you with the information necessary to make informed managerial decisions. Focus your reading efforts on Chapters 1 to 5 in the first instance, and delve further if required.

With a better understanding of your website visitors, you will be able to tailor page content and marketing budgets with laser-like precision for a better return on investment. I also

discuss advanced configurations (Chapter 9, “Google Analytics Customizations”), which provide you with an even greater understanding of your website visitors so that you can dive into the metrics that make sense for your organization. In as many areas as possible, I include real-world practical examples that are currently employed by advanced users.

You can use this book in several ways. The most straightforward (and demanding) is to start at the beginning and follow all the steps to completion, building your knowledge in a step-wise fashion. Alternatively, I have deliberately designed the book so that you can skip around and delve straight into a chapter as needed. To help with this approach, I frequently reference content within the book or other resources for further reading. However, I do recommend you put time aside to review the initial chapters (Chapters 1 through 5) because they introduce important approaches to web measurement, such as accuracy and privacy considerations, as well as the key features and components of the reporting interface. Web analytics is still a nascent industry, and I am actively blogging about Google Analytics, the book’s content, and measurement issues in general at www.advanced-web-metrics.com. You can also follow my thoughts or what I am currently reading on Twitter (@brianclifton). All code examples presented can be downloaded from the site using the referenced links within each chapter.

What You Will Learn

You will learn how to implement and *use* Google Analytics in a best-practice way. I deliberately emphasize the word *use* because this is the primary purpose of this book. That is, you will learn how to leverage Google Analytics to optimize your website—and therefore your business—in terms of marketing, user experience, and ultimately conversions, all based on solid, reliable data.

What You Need

First and foremost, you need an inquisitive mind! This is not an engineering book, and you require no additional software or tools to apply the advice—just a good understanding of what your website is supposed to achieve and how your organization is marketing it and an idea of the type of metrics that would help you judge its success.

That said, a couple of chapters do require you to have a good understanding of HTML and basic JavaScript skills. If that doesn’t describe you, read Chapters 1 through 5, then Chapters 10 through 12. Then pass the book to a technical colleague who can help you with Chapters 6 through 9. As you will learn, web analytics requires a multidisciplinary skill set, and collaboration is the key to success.

What Is Covered in This Book

Advanced Web Metrics with Google Analytics is organized to provide you with a clear step-wise progression of knowledge building.

Chapter 1, “Why Understanding Your Web Traffic Is Important to Your Business,” introduces you to the world of web measurement, where it fits in, and what you can achieve.

Chapter 2, “Available Methodologies and Their Accuracy,” provides the context of what can be measured via web analytics and its limitations.

Chapter 3, “Google Analytics Features, Benefits, and Limitations,” focuses on what Google Analytics can do for you.

Chapter 4, “Using the Google Analytics Interface,” walks you through the user interface, highlighting the key functionality.

Chapter 5, “Reports Explained,” reviews in detail the top reports you need to understand.

Chapter 6, “Getting Started: Initial Setup,” gets you quickly up and running with the basic install.

Chapter 7, “Advanced Implementation,” takes you beyond the basics to give you a more complete picture of your website’s activity.

Chapter 8, “Best Practices Configuration Guide,” provides you with the knowledge to define success metrics (KPIs) and segment your data.

Chapter 9, “Google Analytics Customizations,” gives you some lateral thinking for adding extra functionality to Google Analytics.

Chapter 10, “Focusing on Key Performance Indicators,” is about how you focus on the metrics most important to you—KPIs and the process required to build them.

Chapter 11, “Real-World Tasks,” jump-starts your analytical skills by showing you how to identify and optimize poor-performing pages, site search, and online and offline marketing. Website Optimizer is introduced as a method for testing a hypothesis.

Chapter 12, “Integrating Google Analytics with Third-Party Applications,” shows you how to integrate data either by capturing cookies or using the new Google Analytics export API.

Appendix A, “Regular Expression Overview,” gives you an introduction to understanding regular expressions.

Appendix B, “Useful Tools,” describes some useful tools for helping you implement and use Google Analytics.

Appendix C, “Recommended Further Reading,” gathers together books, blogs, and other web resources that can help you.

Google Analytics Individual Qualification

Democratizing web analytics data was a big part of the initial adoption strategy of Google Analytics. In 2007, while I was at Google, we really wanted to see such useful data being shared between sales, marketing, PR, senior management—anyone who had an interest in improving the company’s website.

However, providing such large-scale access to data presented another problem: People didn't know how to interpret the data or what to do next. There was a serious dearth of web analytics education available to help people. I knew I could assist by writing this book, and another ambition was to establish an online learning center for Google Analytics.

It was therefore a logical step to produce an online version of our tiered internal training system so that any person, not just Googlers, could work through the online tutorials and then take the exam to demonstrate to their peers and potential employers their analytical and product-specific skills.

We started building the www.conversionuniversity.com online learning center in late 2007 and introduced the Google Analytics Individual Qualification (GA IQ) in November 2008. It was a huge achievement for the team and one that I am immensely proud of.

While there is nothing like a classroom workshop for a great learning environment—you not only learn the necessary skills, you also gain from the expertise of the trainer (as well as have time to pick their brains directly over a coffee!)—that's not always possible. Fortunately, this book, www.conversionuniversity.com, and the GA IQ help users learn Google Analytics and then have tangible proof of their proficiency. If you haven't taken the test, I encourage you to do so soon after reading this book.

How to Contact the Author

I welcome feedback from you about this book or about anything related to website measurement and optimization. You can reach me via any of the following means:

- Website: www.advanced-web-metrics.com
- LinkedIn interactive group for readers of this book: www.linkedin.com/groupInvitation?groupID=66386
- Twitter: <http://twitter.com/brianclynton>
- LinkedIn profile: <http://uk.linkedin.com/in/brianclynton>

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Measuring Success

Lord Kelvin is often quoted on the reason metrics are so important: “If you cannot measure it, you cannot improve it.” That statement is ultimately the rationale for web analytics. By enabling you to identify what works and what doesn’t from a visitor’s point of view, web analytics is the foundation for running a successful website. Even if you get those wrong, web analytics provides the feedback mechanism that enables you to identify mistakes quickly.

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In Part I, you will learn the following:

- Chapter 1 **Why Understanding Your Web Traffic Is Important to Your Business**
- Chapter 2 **Available Methodologies and Their Accuracy**
- Chapter 3 **Google Analytics Features, Benefits, and Limitations**

