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Designing for Performance

WEIGHING AESTHETICS AND SPEED

Lara Callender Hogan

Designing for Performance

As a web designer, you encounter tough choices when it comes to weighing aesthetics and performance. Good content, layout, images, and interactivity are essential for engaging your audience, and each of these elements has an enormous impact on page load time and the end-user experience. In this practical book, Lara Hogan helps you approach projects with page speed in mind, showing you how to test and benchmark which design choices are most critical.

To get started, all you need are basic HTML and CSS skills and Photoshop experience.

Topics include:

- The impact of page load time on your site, brand, and users
- Page speed basics: how browsers retrieve and render content
- Best practices for optimizing and loading images
- How to clean up HTML and CSS, and optimize web fonts
- Mobile-first design with performance goals by breakpoint
- Using tools to measure performance as your site evolves
- Methods for shaping an organization's performance culture

“If you’ve ever wondered how aesthetic choices impact performance or how cellular networks degrade your site’s user experience—read this book. *Designing for Performance* gives you the tools to make and measure high impact performance improvements on your site, including actionable strategies to increase awareness of performance across your company. Great performance is good design.”

—Jason Huff

Product Design Manager, Etsy

Lara Callender Hogan is the Senior Engineering Manager of Performance at Etsy. She champions performance as a part of the overall user experience, striking a balance between aesthetics and speed, and building performance into company culture.

USER EXPERIENCE/USER INTERFACE DESIGN

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Praise for *Designing for Performance*

“Designing for Performance is the book to hand to anyone—designer or developer—who wants to start making faster sites. Lara carefully and clearly explains not just how you can create better performing sites, but how you can champion performance within your organization ensuring it remains a priority long after launch.”

TIM KADLEC—INDEPENDENT DEVELOPER AND CONSULTANT

“A web experience’s performance evokes emotion from users just as much—if not more—than its aesthetics. Lara’s book is so essential because she helps us understand that performance isn’t just a technical best practice; it’s an essential design consideration. By providing a slew of helpful tips and best practices, Lara provides a map for anyone looking to establish a culture of performance in their work.”

BRAD FROST—WEB DESIGNER

“Speed is an integral part of design. A beautiful website or app that takes forever to load will be viewed by no one. This book gives designers the knowledge they need to build fast web experiences.”

JASON GRIGSBY—CO-FOUNDER, CLOUD FOUR

“Design is the foundation of your performance strategy: it defines the user experience and expectations, shapes development, and directly impacts operations. This book should be required reading for designers and developers alike.”

ILYA GRIGORIK—WEB PERFORMANCE ENGINEER, GOOGLE

“If you’ve ever wondered how aesthetic choices impact performance or how cellular networks degrade your site’s user experience, read this book. Designing for Performance gives you the tools to make and measure high impact performance improvements on your site, including actionable strategies to increase awareness of performance across your company. Great performance is good design.”

JASON HUFF—PRODUCT DESIGN MANAGER, ETSY

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Designing for Performance

by Lara Callender Hogan

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[TI]

This book is dedicated to my mother and father

*And if that one dream should fall and break into a thousand pieces,
never be afraid to pick up one of the pieces and begin again.
Each piece can be a new dream to believe in and to reach for. This is
life's way of touching you and giving you strength.*

—FLAVIA WEEDN

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[*Foreword by Steve Souders*]

The next major milestone in the adoption of performance best practices is evangelism within the design community.

When I started collecting performance best practices, I focused on optimizations that did *not* impact the amount of content on the page. I wanted to avoid the “performance versus design” debate. (I knew the designers would win!) Within this constraint, there are still many optimizations that significantly improve performance: gzip, CDNs, caching headers, lossless image optimization, domain sharding, and more.

That was 2004. Today, many of those obvious optimizations are in place. And yet the size and complexity of websites grows at a rate that makes it a challenge to deliver a fast, pleasant user experience. Making today’s websites fast requires considering the performance impact of richer, more dynamic, and more portable web content. Luckily, developers and designers share a drive to deliver the best user experience possible. This is the fertile ground that awaits you in Lara’s book, *Designing for Performance*.

There’s no question that a website’s aesthetics are critical to delivering a compelling user experience. Now, after 10 years of gathering best practices, highlighting success stories, and evangelizing the need for speed, web performance is also recognized as being critical. It’s time to discuss design and performance together—not as a debate, but as a collaboration that results in a beautiful user experience.

I use the word *beautiful* intentionally. The design of a website, its aesthetics, is often described with words like *beautiful*, *refreshing*, *compelling*, and *exciting*. Those descriptors are equally applicable to the experience of a fast website. After experiencing the *sluggishness* and *frustration* of a slower alternative, users find that an optimized website is also a beautiful experience.

Thanks to *Designing for Performance*, designers and developers have a framework for their collaboration. Lara outlines the questions that need to be answered, and the means for answering them. She provides numerous examples of the trade-off discussions that lay ahead and how successful teams have resolved them. Most important is that Lara compels us to start these discussions *early* in the design and development process, while code and mockups are still evolving and there's time to recognize and resolve performance challenges to deliver the beautiful experience that users deserve.

—Steve Souders, Fastly Chief Performance Officer
Author of *High Performance Websites* and *Even Faster Web Sites*

[*Foreword by Randy J. Hunt*]

Designers often lament when design is treated like “icing on a cake,” a decorative layer to make something beautiful and desirable. Icing is applied at the end. Icing appears nonessential.

Inside is much more important, we think. The heart of the cake is where the flavor resides. The cake is named for what’s under the icing (carrot), not the icing itself (cream cheese). Oh, the content! Soft, rich, flavorful content. We fall out of love with the icing. We, the designers, are focused on “more important things.”

Time passes, and we come around. We argue with our younger selves. There *is* value in the icing. Oh, that icing! It tells people what to think and how to feel about the cake, even before they try it. It is the primary interface to the cake.

More time passes, and again we come around. The icing and the cake are meant to live in harmony. They complement each other. The icing holds the layers together. The layers give the icing a foundation, a purpose, and volume. We start worrying as much about the icing as the cake inside. Form and content, wed together in a satisfying whole.

And often, we stop there. Ta-da! We’ve done it—we’ve become an experienced, nuanced designer.

And yet we can’t make a delicious cake. We haven’t paid attention to the most important and most often overlooked details, the invisible ones. Are the ingredients of high quality? Are the ratios and timings right for the altitude, pan, and application? What ingredients do we combine when? What can we do to make the cake maintain its integrity while traveling?

Designed experiences are full of these seemingly invisible details. They’re details we blissfully ignore, but we do so at the risk of not ever baking an excellent cake. They’re the details that allow us to manipulate

the context for the design itself. Sometimes they're deep in the technology (like the nuances of image compression), and sometimes they're outside the design (how a browser renders a web page).

The novice designer sees the surface. The experienced designer looks below the surface, at the content, the purpose. The enlightened designer understands the surface and the content, and pursues manipulation of the context.

Designing for Performance will help you understand and control the previously invisible attributes that make your design work well. It'll be delicious. Don't eat too fast, but please proceed with making your designs much, much faster.

—Randy J. Hunt, Creative Director, Etsy
Author of *Product Design for the Web*

[Preface]

If you are making decisions about the look and feel of a website, you are making decisions that directly impact the performance of that site, even if your job title doesn't include the word *designer*. Performance is a responsibility that can and should be shared across disciplines, as everyone at an organization impacts it. Whether it's convincing upper management that performance should be a priority, considering your options when weighing aesthetics and page speed in your day-to-day work, or educating and empowering other designers and developers within your organization, you have a large suite of tools and technology available to help you champion site speed.

Designers are in a unique position to impact overall page load time and perceived performance. The decisions that are made during the design process have an enormous impact on the end result of a site. I believe it's important for designers to understand the basics of page speed and the choices they have at their disposal to optimize their markup and images. I also believe it's imperative that designers weigh the balance between aesthetics and performance to improve the end user experience, and that everyone making changes to a site has the ability to measure the business metric impact of those changes.

After giving talks, workshops, and keynotes on frontend performance for years, I realized in talking with audience members that culture change is central to the performance topic. No one likes being a performance "cop" or "janitor"; these roles are unsuccessful in effecting long-lasting performance improvements on a site, since there are so many other people responsible for that site's user experience. While most of this book focuses on the technology and techniques behind making performance improvements, the final chapter is dedicated to

performance as a cultural problem that cannot simply be solved with technology. Culture change is perhaps the hardest part of improving a site's performance.

Because I work at Etsy as an engineering manager, this book will include a number of references to Etsy and its engineering team's experiments. I currently manage the performance engineering team, and previously managed the mobile web engineering team. Throughout my career (and at Etsy) I've worked closely with many phenomenal designers, and I'm really excited to develop this resource specifically for them.

How This Book Is Organized

Within this book, we'll cover various online tools and software that can aid you as you make performance improvements. In chapters where image generation is covered, we'll use Photoshop within our examples rather than other kinds of image editing software.

In Chapter 1, we will cover the impact that page load time has on your site, your brand, and your audience's overall experience. Page load time is one of many factors that make up the user experience, and studies have shown that poor performance will negatively impact a site's engagement metrics. As more people are using mobile devices to access the Internet, a focus on performance will increase in priority, as mobile networks and hardware have a negative impact on page load time. Designers are in a unique position to improve page load time, and therefore, the overall user experience as well.

Chapter 2 covers the basics of page load time. It's important to have a foundation of knowledge regarding how browsers retrieve and render content for sites, as these are the main levers you can use to improve your site's performance. We'll also cover perceived performance, and how it differs from total page load time; the way users experience your site and perceive how quickly they can accomplish the one thing they want to do is an equally important metric to measure.

We'll walk through each of the main image formats used on the Web today within Chapter 3. We'll cover best practices for use and optimization for each file type. Included in this chapter are techniques to optimize the way images are loaded into web pages, such as spriteing or replacing them with CSS or SVG. Lastly, we'll cover what you can do

to increase the longevity of your optimized image solutions, including implementing style guides or automated workflows for image compression.

In Chapter 4, we will cover how to optimize the markup and styles implemented on your site. A thorough cleanup effort is incredibly important for both your HTML and CSS, followed by optimization of any web fonts used on your site. Focusing on creating clean, repurposable markup and documenting any design patterns will save both development time and page load time in the future as the site is edited or improved. We'll also cover the importance of load order, compression, and caching of your site's text assets.

Responsive web design is known for being “bad for performance,” but it doesn't have to be! In Chapter 5, we'll walk through how important it is to be deliberate with the content, including images and fonts, you choose to load for your visitors across screen sizes. This chapter also covers how to approach responsive web design: create performance goals by breakpoint, use a mobile-first approach with your design, and measure your responsive design's performance at various screen sizes.

To understand the state of your site's user experience today as well as how it changes over time, it's imperative that you benchmark major performance metrics routinely. Chapter 6 will detail various browser plug-ins, synthetic testing, and real user monitoring tools and how they can help you measure your site's performance. Using these tools continuously as your site evolves to measure changes in performance and document why these changes occurred can help you and others learn about what impacts *your* site's performance.

In Chapter 7, we'll outline the various challenges you'll encounter when weighing aesthetics and performance. There are operational costs to consider, user behaviors to measure, and plenty of open-ended questions to ask when it comes to making these hard decisions. However, equipped with performance knowledge, a solid workflow, and experiments, you can make design and development decisions that result in an excellent overall user experience.

The largest hurdle to creating and maintaining stellar site performance is the culture of your organization. No matter the size or type of organization, it can be a challenge to educate, incentivize, and empower