Building Responsive Data Visualization for the Web

Bill Hinderman

WILEY
Building Responsive Data Visualization for the Web
For my grandmother, Mary.
You showed me that the Internet is for people.
Bill Hinderman is a software engineer and designer from Chicago. He is the lead site optimization UI engineer at Orbitz Worldwide (orbitz.com), and a space cadet and designer at Starbase Go (starbasego.com). He designs, prototypes, develops, and A/B tests experimental new products for customer-facing brands.

He works alongside artistic and entrepreneurial individuals to craft innovative web experiences. Bill received his B.S. in computer science with a specialization in UI development from the University of Illinois in 2012. He’s a speaker at conferences on the future of web development, data visualization, and cross-platform design.

Bill is an avid runner and cocktail-maker, and he can wear the hell out of a suit. When he was four, he penned My Book About Me, in which he stated that he was glad he wasn’t a giraffe, and that his least favorite thing to do was sitting. Both of those statements hold true to this day.
**About the Technical Editor**

**Randy Krum** is an infographics and data visualization designer, author of the book *Cool Infographics: Effective Communication with Data Visualization and Design* (Wiley, 2014), and instructor of Infographics and Data Visualization Design at Southern Methodist University’s Continuing and Professional Education program (CAPE). Randy also runs the popular website Coolinfographics.com. Started in 2007, the site has grown into one of the most influential infographic sites online, handling up to 50,000 unique visitors per day. He is the founder and president of InfoNewt, a design company that creates infographics and visualizations for clients used for both online marketing and internal communications. Randy speaks at conferences, universities, corporate events, and government agencies about infographic design, data visualization methods, visual content marketing, and the effective use of visual information. Learn more at RandyKrum.com.
I want to thank Carol Long from John Wiley & Sons. After opening for the morning coffee break at the Data Visualization Summit in Boston, you walked up to me with a coffee in one hand and a business card in the other, and asked if I would like to write a book. Without your willingness to approach some ridiculous 24-year-old kid, this whole thing never would have happened.

I also have to give my most heartfelt appreciation to my project editor, Adaobi Obi Tulton. You were equal parts patient and stern regarding deadlines and deliverables, in a way that made this long book-making process enjoyable.

I also owe a massive thanks to Randy Krum for not only acting as technical editor on the book, but also giving me advice—as someone who has done this same thing before—on pitfalls to avoid, and paths to take.

Finally, I want to offer apologies to any family members, friends, coworkers, and strangers I was rude to, short with, or otherwise unpleasant to be around during deadline weeks. I promise it wasn’t you.
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Introduction

Before we do anything, I want to tell you about my first experience with the web.

It was 1996, and I was at home, sitting at my mother’s Windows 3.1 machine. We had recently heard about this “Internet” from my grandmother, who had been using it to communicate with a friend living in Hong Kong.

To us, this was science fiction. I was six years old, however, and science fiction wasn’t as sharply differentiated from science fact as it (sometimes) is today, so it never occurred to me that this shouldn’t be possible.
This was my first time at the computer in a week, not because I wasn’t using a computer regularly already, but because a week prior I had gotten up very early, logged onto my mother’s computer, and, having memorized the keystrokes and icons, rather than the actual words, navigated to the Control Panel and turned every single background, foreground, and text color white. When I got home from kindergarten that day, I was greeted less kindly than with the typical chocolate milk and *Happy Days* reruns.

Someone who can’t differentiate between science fiction and science, fact

Therefore, a week after dismantling my minimalist design, I was about to experience the Internet. My next-door neighbor at the time was also named Billy; and in a grand act of vanity, I decided I would send my first e-mail message to the only other person I knew who shared my name.

I opened the e-mail client and slowly chicken-pecked the following:

Isn’t technology great!?

-Billy H.

In little-kid time, it took somewhere between one second and 700 years for this e-mail to be sent. Immediately, I called the other Billy on the phone to see if he had
received it. He had to get off the phone to check. Eventually, he responded with a poignant piece of writing that I carry with me to this day:

    yes!!

    -Billy R.

The e-mail client, sitting in its own white window on a background I had begrudgingly recolored a neon yellow, wasn’t much more than a WYSIWYG editor and a list of contacts—the same as it looks today.

At six, I felt like I had just sent a message to Hong Kong.

Five years later, I was sitting at my grandmother’s house. My great-grandmother, who was a rock star and could beat any of you at Scrabble so don’t even try, was in a nursing home that housed both a group of eccentric old retirees and a surprisingly tech-savvy administrator.

I had decided, after losing at Scrabble, that I would make my first website: a face book for all the people on my great-grandmother’s floor of the nursing home, a way to let them say hello to their loved ones online. The administrator was over the moon about this. At eleven, I had to open an MS-DOS prompt and manually connect to the free web hosting included with my mother’s e-mail address at the time, then FTP individual HTML files to the server. That website eventually led to my winning a Jefferson Award for Public Service and renting a (small) tuxedo to talk about the Internet, surrounded by adults who were making a tangible difference in the world.

I was once again living in the world of science fiction.

Five years later, I had my first cellphone. It did not have any Internet-connected features. At the time, having Internet connectivity on your phone meant one of two things:

- You were using it for e-mail.
- You were in a commercial for cellphones.

I had no inclination that the little clamshell in my pocket would morph into the primary way that I now access the web every day.
A year later, the iPhone would launch.

Today, we hold our Internet to a higher standard. We (I, because I know who I am and what I do for a living, and you, because you have opened this book, which means I can make wild assumptions about you) make things for the web. We make websites, and web apps, and landing pages, and blogs, and magazines, and dashboards, and we do all of this because we have a vested interest in making the Internet something amazing.

My degree is in computer science, with a focus in UI engineering and human-computer interaction. I shimmied backward into web design because I missed changing all of my mom’s system colors to white, and because nobody else I was working with ever wanted to also be the designer when we were up at 4:00 a.m. regurgitating data structures.

I cut my teeth on data visualization toward the end of my college career. A friend (with whom I would go on to form my studio) and I were working on a comically uncreative idea: tracking the level of crowd, drink and food specials, and how many friends were at any given venue on a given night. (It was far from the next Facebook, but we were young and shiny and dumb.) Never before, and often since, I felt the intense joy of watching a complex set of numbers turn into something readable, approachable, even friendly.

Because I’ve lived in this dual role of developer and designer for the entirety of my professional career, I have never been able to separate the visual design of how a website, a visualization, a pixel might look from its actual implementation—and I think that this is an important way to look at what you create for the web.

Our industry is responsible for some of the most amazing advances in the past 25 years; but it’s also responsible for the tidal wave of absolute garbage being shoved into consumers’ faces on a daily basis. Not only do we create content, we also create the vehicles by which other people create and consume content.

But I don’t want to scare you.

We’re the good guys. We’re designers. We get to decide what is made, how it works, and exactly how consumers interact with it; but there’s one thing that has always left me speechless: We’ve made it this far without a plan.