

Cartography 2.0: For people who make interactive maps

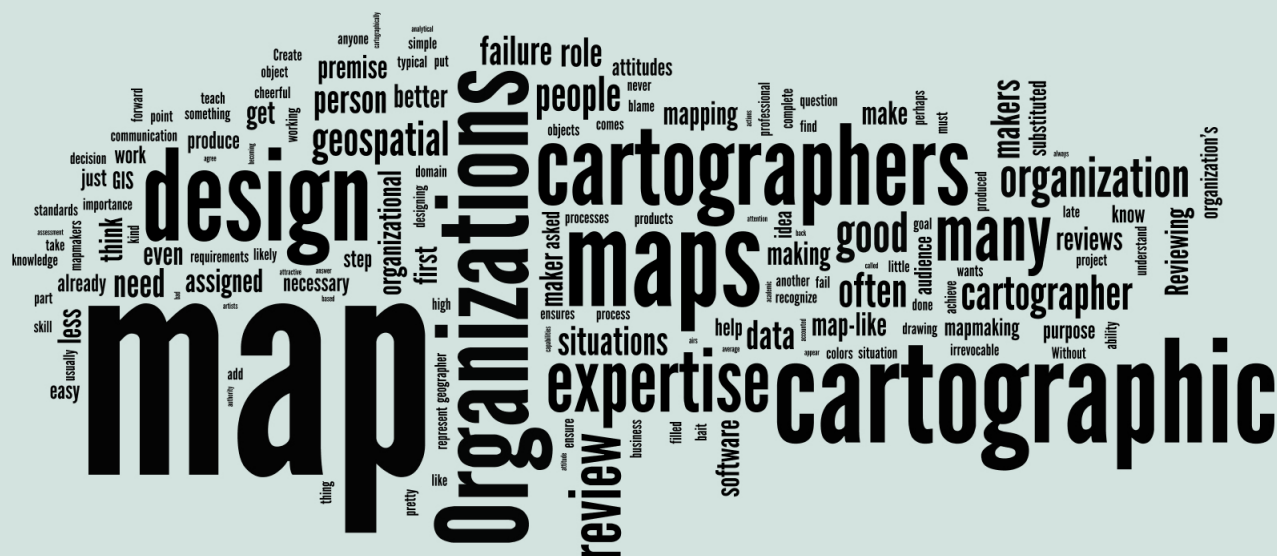
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Cartography 2.0 (<http://Cartography2.org>) is a free online knowledge base and e-textbook for students and professionals interested in interactive and animated maps. I (Mark) pitched the idea of doing an ‘online textbook’ to my co-authors because I knew that, as teachers, we were all frustrated with the inability of traditional textbooks to keep pace with the constant stream of new Web technologies. Further, we could not find any comprehensive online resources about web-based mapping that provided the same breadth and depth we’ve come to expect from a professionally produced textbook. The kind of knowledge that is needed to make dynamic maps spans many (traditionally separate) fields from computer science to education. While there are great books on all of these fields individually, none offered an answer to the basic question I’ve been asked many times: what’s the important stuff I need to know about making great on-demand/interactive maps?

As a response to that question, I thought I would try to distill what I knew into an open, online resource and share my experiences of making web-based maps over the past 15 years. Of course, it soon became clear I needed

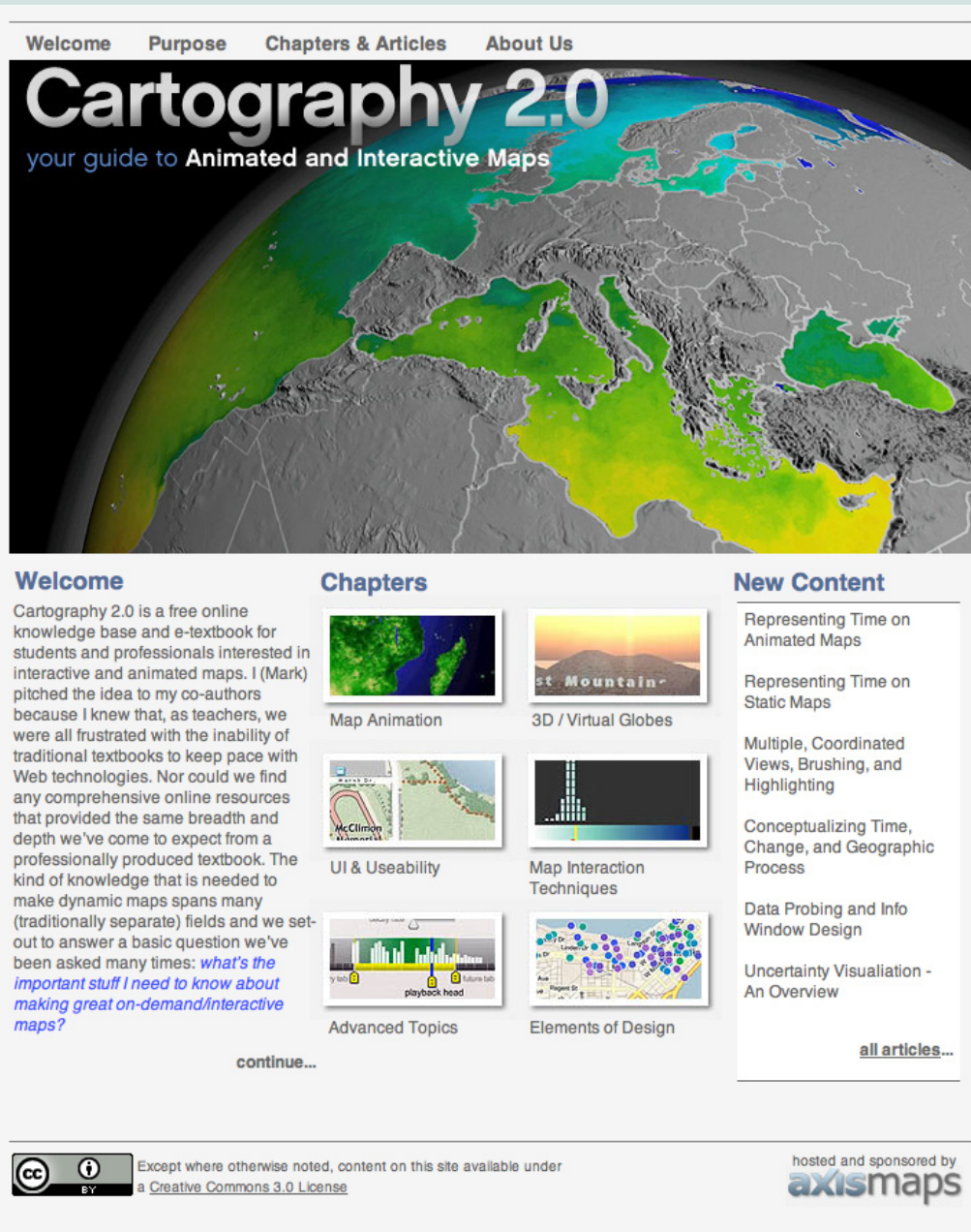


Figure 1: Cartography 2.0 web site

help from my friends! The initial Cartography 2.0 team is myself, Anthony Robinson, Rob Roth, and Ben Sheesley, each of whom brings expertise in different areas of cartography. Axis Maps (axismaps.com) is the primary supporter of this effort and is hosting and maintaining the site for us.

The task we set ourselves was simple: If we only had 30 minutes to share everything we know about topic X, what would we talk about, what would we demo, and what advice would we offer?

From what we could see, at least five basic problems that are encountered when publishing material about emerging mapping technology:

1. **SPEED:** The world of Web-based mapping is evolving at light speed and textbooks are at least two or three years out-of-date by the time

they reach students. That is a lifetime online (e.g., Google Maps is only four years old!) and rapidly emerging areas like location-based services and crowd sourcing—which are profoundly re-shaping and expanding our notion of ‘mapping’—are terms that weren’t even coined when today’s textbooks were being written. No doubt, the next big thing(s) are happening now, as you read this.

2. **LEARNING DEMANDS ‘LIVE’ EXAMPLES:** Static screen captures of animated and interactive maps are a very poor substitute for the real thing. Imagine trying to share the joy of using Google Earth with two or three black-and-white screen captures? It is critical that people can get their hands on real working examples if they want to learn how to make great dynamic maps and understand how people use them. In the classroom, we assign URLs like an English teacher assigns novels; to become an expert in a field you have to immerse yourself in the works of that field. A CD-ROM insert in a textbook separates content from examples and is just as old as the book itself. The Web is “in the wild,” and we have to venture into it to understand it. (Fellow cartographer Rob Edsall has been saying this for years.)
3. **BUILDING TWO-WAY LEARNING:** Most of the mapping projects we’ve been involved with require input from a handful of people with a wide array of domain expertise. Ensuring that we tap into the knowledge base of this diverse group is essential for complete success of the project, but often is simply not feasible. What is needed with Cartography 2.0, then, is a way to facilitate an interactive learning community where folks post questions, comments, and links in response to our own contributions (i.e., a community where everyone is allowed to interact with each other). This idea is nothing new in online education and these kinds of ‘learning communities’ are at the very heart of the Web 2.0 ethic.

In both subtle and apparent ways, our university classrooms are already two-way learning communities. Despite our best efforts to stay on top of things, we have found that our students are routinely ahead of us on emerging concepts and technologies. In this way, our students act to keep us current, while we act to synthesize this input and integrate the state-of-the-art into extant frameworks, removing from our lecture notes what is now outdated. We expect a similar reciprocity with the learning community implemented in Cartography 2.0, where everyone plays the role of both teacher and student.

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4. **CONSTANT UPDATES:** The great thing about online publishing is that material can be constantly updated and revised as the world of mapping moves forward and outward. There are now sophisticated technologies for identifying what is new on the Web. Many power Web users spending much of their time online in a content reader that stitches together numerous RSS feeds (i.e., real-time updates) from previously identified sources of interest, rather than actually seeking out new sources of information. This is a primary reason why Wikipedia is the most commonly referenced resource for encyclopedic knowledge: it

is hands down the most current. While Wikipedia may not always be the most accurate resource—and is undeniably used as a battle ground for competing ideologies with misinformation purposefully posted—it is definitely the most current resource for quickly changing fields. We hope that Cartography 2.0 can act as a similar resource for subjects cartographic. As new applications, strategies, and theories are released, they can be immediately disseminated to the readership. While this initial pass may not be complete or accurate from a textbook perspective, these rough edges can be softened over time through active discussion and iterative content updates.

5. **EXPENSIVE:** We firmly believe (as do many) that the era of the \$150 textbook is coming to an end. While this is sad for our friends working in publishing houses, it is a boon for authors who now have others means for reaching—and indeed, creating—their audience. Authors are able to eliminate much of the overhead (and editorial red-tape) that consumes that \$150 price tag.

Digital publishing is a boon for readers too, as they are now able to find and access content more easily and also embed content into a larger web of ideas (e.g., StumbleUpon, Digg, del.icio.us). Simply put, removing the financial barrier means that more people can access educational material about dynamic mapping, which not only means that more people can make dynamic maps, but that more people can construct great dynamic maps that better serve the needs of the targeted user audience. This, in turn, will generate a larger group of people who can contribute to Cartography 2.0, (hopefully) generating a positive feedback loop.

Please have a look at Cartography2.org and let us know what you think and send us a note if you'd like to see any other material. New material is added to the site continuously, so please subscribe to our RSS feed. Our goal is to continue to bring in contributors and have the site grow over time far beyond these initial topics and articles. Cheers!

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Figure 2: Cartography 2.0 Examples

Case Study in Selecting a Map Font

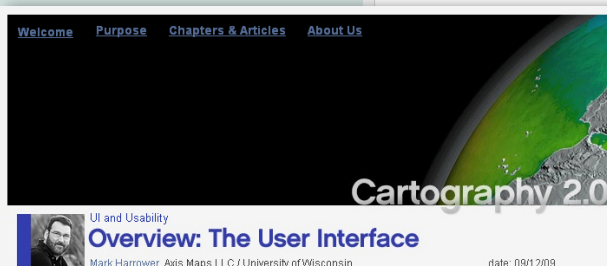
Despite the vast number of fonts available to choose from, we've found that only a few serve our purposes well and therefore we tend to return to them over and over again. Officina (both *Officina Sans* and *Officina Serif*) is one such font (a font family, really) that we've found to be highly versatile, employing it on everything from map user interfaces to printed reference maps. It was originally designed by Erik Spiekermann as a robust font for business correspondence, including memos, faxes, photocopies, and other documents output at course resolutions. A number of design characteristics, drawn from the list above, make it an ideal candidate for maps appearing on screen. Officina has a tall x-height, wide apertures and large counters, as seen in the letters 'c', 'a', and 'e', for example. Serifs are blocky and square in shape, and strokes are consistently strong, having low contrast. By design, Officina is also a relatively narrow type family (considerably narrower than Trebuchet MS but not as condensed as Arial Narrow, for example), which makes it effective in high density labeling scenarios.

Officina Serif Book
Officina Serif Book Italic
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of the Officina font family



Three basic questions underpin the development of all interactive mapping systems; if you want to make an interactive map, consider the following 3 questions:

- (1) **what type** of interactivity is needed (*kind of control*),
- (2) **how much** interactivity is needed (*degree of control*), and
- (3) how should this interactivity **be implemented** (*method of control*)?

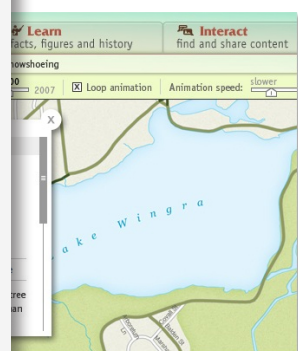
WHY THIS MATTERS: This section will help you to answer those questions and will encourage you to develop a careful, objective approach to each map you make so that (1) you don't waste your time or your employers money on bad ideas, and (2) you can increase the chances that your maps will work once they are released into the wild.

Many of us, more often than we'd like to admit, have felt the sting of showing people our work **only to have them confused** by what we thought was a great user interface, or worse, see them **underwhelmed** by our work (I remember cringing once upon hearing "so, um, I can't click on anything...I just pan and zoom"?). While you can't hit a home run every time, you'll sleep better knowing you map is both useful and easy to use. In order to get to that cartographic Nirvana, though, we're going to have to take a journey through the related fields of *Human Computer Interaction* and *Interface Design* (and *here*). Much of this might be old-hat to you, and at the very least if you've used software or the Web for even a few minutes then you'll certainly recognize much of the advice and insights in this chapter. The pros know making good maps in the 21st century requires knowing a lot about stuff that seems way beyond the borders of 'cartography'. The user interface, and how people work with your map—a **field called usability**—is critically important.

Five things all designers should always remember:

- #1: No matter how great your data or mapping skills are, if your user interface (UI for short) is opaque and cryptic your map will fail. Period.**
- #2: Don't try to be too clever.** UI's that 'show-off' should be avoided; for example, despite having been tried numerous times over the past 15 years, there are still homepages that make it really hard to find the buttons and content and you spend a lot of time hunting around and clicking on stuff and nothing happens (well, expect for the rapid departure of most anyone over the age of 14). **Bad UI designs don't make your work 'edgy' and 'cool', it just makes it annoying.**
- #3: We live in a mouse-happy-culture where folks won't wait long.** This problem is only getting worse as people now expect amazing maps and applications to work instantly. At let's be honest, we're all guilty of this. I know I often give-up on content that was taking 'too long' to load...maybe even after just 2-3 seconds. Our willingness to hang-in there is low especially if we didn't pay anything to be there in the first place; our time is the only cost with being there, so we try to save it accordingly. Bottom line: **if your map is underwhelming, boring, or hard to use, folks will leave pretty quickly.**

#4: Don't design for yourself: I don't really care, nor does the person writing your paycheck, if you think the map and UI are the coolest thing ever. Unless you're going to buy a hundred thousand copies of the map, check your ego and realize that not all of your good ideas will work and everyone, even seasoned pros, can benefit from some feedback (aside: You can always tell when an author becomes big enough they no longer feel the need for an editor - it always shows). **Design for your audience, not yourself or your friends.** What's wrong with our friends? Well, they likely have similar tastes and skills and are not likely to be a representative sample and more importantly, they're your friends and don't want to hurt your feelings and may feel the need to sugarcoat feedback. I've had to redo large pieces of a project when it became clear our approach wasn't going to fly with the users. It's frustration



Officina Sans is used for all of the interface text on the UW-Madison interactive map

