How to make data look sexy

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From Fernanda Viegas and Martin Wattenberg, for CNN

We all know what makes a good graph or chart. It should be a clear, precise presentation of the data. Right?

That was certainly the conventional wisdom of the 20th century. Psychologists such as William Cleveland ran experiments to rank chart attributes such as position, area, angle, and color by how precisely we perceive them.

Others wrote papers proving that animation was distracting and unhelpful to comprehension. Edward Tufte proposed maximizing a "data-to-ink ratio," ushering in an era of bare-bones chart design.

The single-minded pursuit of clarity and precision led to designs that were, sure enough, clear and precise. Grid lines receded discreetly into the background; Tufte's beloved beiges and tans became standard recommendations.

Graphs have become easier to read, though their minimalist uniformity sometimes feels like a library where all the books were written by Hemingway.

But in the past decade we've seen a glimpse of other virtues that are equally valuable. When Hans Rosling gave a famous TED talk on world health, he used colorful moving "scatterplots" to make his points.

Was animation really the most precise way to show the data? Probably not, but the motion, color, and energy helped capture the imagination of millions of viewers across the world.

And that's the key to the future of visualization. The 20th-century model often assumed an audience already motivated to receive information, even paid to understand it, as a scientist or stock analyst is.

Today, visualization has the potential to become a mass medium. Engagement -- grabbing and keeping the attention of a viewer -- is the key to its broader success. The clearest, most precise graphic in the world communicates nothing if nobody looks at it.

This isn't to say that clarity and precision have lost their importance, or that we're advocating a license to be tacky. Nobody wants a mindless pursuit of attention that leaves the information landscape looking like Times Square.

But there doesn't have to be a conflict between engaging broad audiences and communicating well. If you look beyond the raw data to content and context, you can create visualizations that attract and even entertain without sacrificing accuracy. We'd like to propose a few "rules of engagement": paths to success for visualization in the 21st century.

You are here

The best kind of visualization, like the best kind of story, is one you can relate to. Ask yourself: can users see themselves? A 2009 New York Times feature showed a graph of unemployment -- including not just averages, but letting readers highlight trends by gender, age, education. The title? "The Jobless Rate for People Like You."

This kind of interaction puts the "you are here" dot in the visualization, orienting viewers and letting them add their own context. ("Aha, so my unemployed 20-year-old sister isn't the only one.") By offering personalized entry points, a visualization turns into a mirror. And we all know people love mirrors!

Let 'em talk

Unlike a graph in a book, visualizations on the web are social artifacts. When a visualization can be shared and discussed, it draws more interest. At the same time, a conversation can lead to a deeper understanding of the data as people ask questions and discuss interpretations.

The power of the social experience to make data analysis both fun and informative is a perfect example of how making a visualization more engaging doesn't have to make it less understandable.

"You cannot not communicate"

As this quote by designer Erik Spiekermann indicates, you have no choice: by the time the first data point hits the screen, you're communicating. The catch: it's a fallacy to think communication happens solely through the data you're plotting. Even before viewers understand the data, they form strong impressions of the intended message based on colors, fonts, and the like.

Because visualizations are, well... visual, their design is a crucial part of what they communicate. This means that when you try your hardest to build a "neutral" visualization, with subdued tones and discreet type, you are in fact creating a specific mood: "This is serious, serious business." As long as that's a deliberate choice, you're being true to your data and to your audience.

But not all data sets are equal. Consider the difference between war casualties and sports scores. Journalists would never dream of covering such disparate subjects in the same manner. Why should you? By realizing that visualization is intrinsically tied to communication, we can stop trying to hide behind an ideal of neutrality and embrace the power of expressiveness.

Emotions and a strong voice aren't necessarily sins in other media, and they shouldn't be in visualization, either. By recognizing that being expressive and engaging doesn't mean giving up clarity, we will have fulfilled the promise of visualization.