A Practical Guide to Graphics Reporting

Information Graphics for Print, Web & Broadcast

Second Edition

Jennifer George-Palilonis

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GRAPHICS REPORTING

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Please visit the companion website at www.thegraphicsreporter.com

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This book has been prepared from camera-ready copy provided by the author.

A PRACTICAL GUIDE TO GRAPHICS REPORTING

Since this book first published in 2006, the field of graphics reporting has changed dramatically. First, information visualization has exploded online and on other digital platforms. Second, information graphics reporting has encompassed nearly every sector of communication and business. Visual reporting skills are not only relevant in traditional news environments, but many other professions as well.

This edition seeks to address these changes by providing learners with a cross-platform, cross-industry approach to instruction. It will include a robust, dynamic companion website complete with regularly updated examples of print, online, and broadcast graphics, as well as useful tutorials and exercises.

This book covers everything you need to know about reporting with graphics, information visualization and graphic design from a journalistic perspective.

Chapters include relevant case studies and conclude with essays from experts. When appropriate, resource files for exercises (such as Illustrator templates, images, and/or other visual reference material) will also be provided on the companion website.

about the author

Dr. Jennifer George-Palilonis is a full professor in the Department of Journalism at Ball State University. She holds the George & Frances Ball Distinguished Professorship and is the co-director for the Center for Emerging Media Design & Development (centeremdd.com). She teaches graduate courses in user experience, usability testing methods, theories and frameworks in human-computer interaction, and design thinking, as well as upper-level undergraduate courses in information graphics reporting and interaction design. She holds a PhD in Human-Computer Interaction from the Indiana University School of Informatics and Computing.

George-Palilonis also runs an applied user experience research lab at Ball State, as well as a digital publishing studio that develops interactive apps for campus organizations and student media. From 2001–2015 she was the sequence coordinator for the nationally recognized Journalism Graphic Sequence at Ball State.

In 2012, George-Palilonis received the national Charles E. Scripps Award for the Journalism and Mass Communication Teacher of the Year from the Scripps Howard Foundation. She also received the Ball State University Outstanding Teaching award in 2012. She frequently leads special topic courses that partner Ball State students with professional organizations. Past projects include collaborations with The Indiana State Museum, Circle of Blue, and the *South Florida Sun-Sentinel*.

She has been a media design consultant and has worked on the redesigns of more than 30 print and online publications since 2000. George-Palilonis frequently speaks at workshops and conferences about user experience design, information graphics, and news design. She is also the author of *The Multimedia Journalist* (Oxford University Press, 2012).

After graduating with a bachelor's degree in journalism in 1996, George-Palilonis worked as a news and business designer at *Detroit Free-Press* (1996–1998). She was also the Sunday art director and deputy news design editor at the *Chicago Sun-Times* (1998–2001). She has been an adjunct instructor at Wayne State University in Detroit and the International Academy for Merchandising and Design in Chicago.

acknowledgments

As with everything I do, this book is dedicated to my husband Jim and my beautiful twins Quinn and Gage. Your support and love make life worth living. You are my inspiration and the most important accomplishments of my life. I would also like to thank the rest of my family for your love, wisdom, and guidance, not just now, but for a lifetime of support. To my parents, Jerry and Jan George, for always encouraging me to strive for excellence.

This book would also not be possible without the support and guidance of my most cherished friends and mentors: Ron Reason, Michael Price, Mario Garcia, Deborah Withey, Marilyn Weaver, and Davide Bolchini. Thanks also to all of the amazing, talented, and supportive journalists I have worked with, especially those at the *Detroit Free-Press* and The *Chicago Sun-Times*. I take the lessons I learned from you into the classroom with me every day. Thanks to colleagues Brad King, Ryan Sparrow, Pamela Leidig-Farmen, Alfredo Marin-Carle, and the rest of the Ball State faculty for nurturing me as a student and later supporting me as your colleague. I also extend special thanks to all of my students, former, present, and future. I learn so many new things from each of you with every semester. I grow with you, and I hope that I have positively influenced you the way so many others influenced me.

Thanks also to everyone who contributed to this book, including Michelle Minkoff, Jeff Goertzen, Bonnie Berkowitz, Ron Reason, Sisi Wei, Gustavo Faleiros, Nigel Holmes, Emily Chow, Terence Oliver, Don Wittekind, Christa Nimmer, Amy Balliett, and J. Carl Ganter. Your expertise lends credibility to my work, and your willingness to share your ideas strengthens our craft.

Finally, I would like to acknowledge that many of the materials that inspired this book were created by Michael Price as lecture tools and assignments used in the visual reporting course at Ball State University. Michael first developed this course in the early 1990s, and I took the course over when I replaced him as graphics sequence coordinator in 2001. The course continues to evolve with the industry but still rests on the foundation Michael established when he helped develop the journalism graphics program at Ball State, of which I am a graduate. His early work helped establish our program as one of the country's finest, and for his dedication and commitment to establishing graphics reporting as a primary sequence of study, all of the program's graduates owe him a debt of gratitude.

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A PRACTICAL GUIDE TO GRAPHICS REPORTING

The art of visual storytelling

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Today, some of the most compelling stories are visual. Driven data and the power of visuals to convey complex ideas, maps, charts, diagrams, and the like have dramatically enhanced the contemporary vocabulary of storytelling. And engaging text and visuals in the service of clear, concise explanation can profoundly support a person's ability to understand and remember information. As a result, opportunities abound for talented graphic designers, data journalists, and illustrators.

Steve Duenes, the graphics director at the *New York Times* says solid news judgment, a ferocious sense of curiosity and a dogged pursuit of answers are required, regardless of whether you're writing, making video or pictures, editing, or creating information graphics. Today visual storytellers also "need to be fluent with data, meaning they should be comfortable asking about it, and they should be able to analyze it and sketch with it once they've got it," Duenes adds.

Indeed, in our complex, data-rich world, the ability to analyze and visualize information is a valuable skill. In fact, the growing importance of data is evident in a variety of ways, from its widespread value to social organizations, to its profound geographic and geopolitical implications. And understanding and consuming complex data, intricate processes, or even everyday events can be daunting. However, information graphics can bring clarity to even the most abstract or complicated ideas.

This book is intended to serve as an introduction and practical guide to understanding the methods, techniques,

"A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away."
Antoine de Saint-Exupéry, French aristocrat, writer & poet
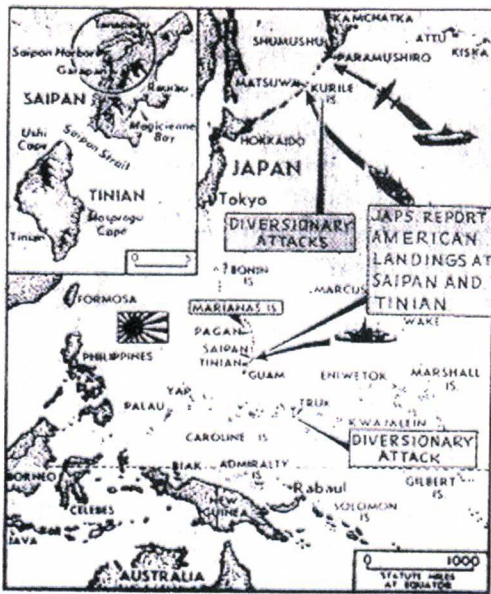
On Thursday, June 15, 1944, the *Birmingham News* (Alabama) ran this rudimentary map explaining the U.S. attacks on Japan and Tinian.

1875: *The Times* (London) prints the first weather map.

1876: *New York Daily Herald* publishes the first U.S. weather map.

Early- to mid-1900s: During World Wars I and II, U.S. newspapers use maps to inform readers of latest developments.

1930s – 1970s: Large U.S. newspapers, such as the *New York Times* and *Chicago Tribune,* use maps and charts regularly.

1960s and 1970s: Most news organizations follow suit.

1980s: Advances in technology and software, as well as the emergence of *USA Today* (a newspaper committed to graphics reporting), contribute to an information graphics explosion at most American newspapers.

and tools for visual storytelling and information graphics reporting. To get us started down that path, this first chapter covers the evolution of visual communication, – from cave paintings to complex interactive graphics – explains some important theories of visual communication, explores the role of the graphics reporter, and introduces the different types of information graphics we will explore more thoroughly in the chapters that follow.

Graphics history

Information graphics have always been part of civilized culture. Before there were written words, there were pictographs, cave paintings and hieroglyphs. Archaeological discoveries suggest that symbolic images used by ancient Egyptians as a form of written communication represent the oldest forms of writing. Ancient cultures in China, Mesopotamia, and the Americas also used images to communicate before native alphabets evolved and modern written language systems were developed.

As human knowledge evolved through the Renaissance and the ages of Enlightenment and Reason, so did the use of maps, charts, and diagrams as a method for recording important scientific, economic, and social data. Later, newspapers increasingly incorporated illustrations, charts, and maps into the coverage of major news events. Also, the invention of the linotype machine in 1886 automated typesetting, leading the way for larger, more detailed information graphics and illustrations in newspapers. For example, through both world wars, U.S. newspapers frequently published maps, and

EDWARD TUFTE: THE INFORMATION VISUALIZATION

Edward Tufte teaches statistics, graphic design, and political economy at Yale University. He is known for his groundbreaking work on the use of graphics to display quantitative information. His books include, *The Visual Display of Quantitative Information*, *Political Control of the Economy*, and *Data Analysis for Politics and Policy and Size and Democracy* (with Robert A. Dahl). He has prepared evidence for several jury trials and has worked on information design and statistical matters for IBM, the *New York Times*, *Newsweek* magazine, Hewlett-Packard, CBS, NBC, the Bureau of the Census, the Bureau of Justice Statistics, International Paper, and New Jersey Transit. He is a fellow of the American Statistical Association and has held fellowships from the Guggenheim Foundation and the Center for Advanced Studies in Behavioral Sciences. He founded Graphics Press in 1983.

during the 1960s and 1970s, charts and diagrams began to appear daily in most American newspapers.

However, the Macintosh computer, which surfaced in the early 1980s, led to an information graphics explosion. The Mac, along with sophisticated graphics software – some still in use, others now dinosaurs – made it possible for graphic designers to easily create detailed maps, charts, and diagrams on deadline.

The frontrunner of the visual storytelling movement was *USA Today*. Its editorial mission was simple: cater to the time-starved reader with tightly edited story packages in an entertaining and easy-to-read format. This meant shorter stories, innovative use of color, and frequent use of maps, charts, polls, and other color graphics in place of traditional, long-form stories. At *USA Today*, graphics were regularly created as stand-alone stories and as companions to text-based pieces. Soon, many newspapers and magazines followed suit, and information graphics became a standard storytelling method.

Today, the rise of data visualization has introduced new challenges for graphics reporters. Understanding the principles of interaction design, how to properly collect and prepare data for visualization, and learning new tools and programming languages have all become important skills. The role of the graphics reporter continues to evolve along with information graphic styles and our audiences.

Before words

Visual storytelling has been a primary form of communication since early humans first drew on cave walls. As a result, information graphics have evolved over centuries.

Ancient charts

3800 BC
Assyrians etched symbols on clay tablets to make maps and drawings.

Photo by Steve F. E. Cameron, Creative Commons license

An ancient Egyptian calendar on the Kom Ombo Temple charts flood patterns of the Nile River.

3000 BC
The Ancient Egyptians developed the first 365-day calendar and used it to map the flood plains of the Nile. The hieroglyphic for "month" appears at right.

2200 BC
Mesopotamians diagrammed land elevations from bird's eye views.

Early maps

540 BC
Greek philosopher Anaximander created the first world map. Anaximander also created a model of the cosmos based on his mathematical and geometrical calculations. The model included several planets, as well as the sun, which he depicted as 27 times larger than Earth.

500 BC
Chinese etched maps in stone tablets.

c. 150
Ptolemy, a Greco-Egyptian writer, mathematician, astronomer, geographer, and astrologer, mapped the world's landmasses with the continents Europe, Asia, and Libya (Africa).

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Ptolemy's world map, known to Hellenistic society in the 2nd Century, first appeared in Ptolemy's book Geography (c. 150). Ptolemy's maps represented the first uses of longitudinal and latitudinal lines.

Mid-1200s
English Scientist Roger Bacon developed multiple systems for examining statistics in conceptual visual data displays.

Art and science

Late-1400s

Leonardo da Vinci – widely considered one of the greatest painters in history – was also a diversely talented anatomist and inventor. Although he is most famously known for paintings like "The Last Supper" or "Mona Lisa," he was more prolific as a draftsman than a painter. In fact, da Vinci kept hundreds of journals full of small sketches and detailed diagrams. Some of them were focused on anatomy, while others depicted novel machines – such as a parachute or giant crossbow – which were interpreted, constructed, and tested.
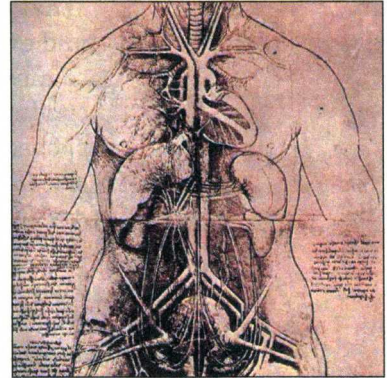
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1637

René Descartes outlined the Cartesian Grid, a system for plotting points on a graph made of intersecting lines, called "coordinates." Descartes' contributions are the basis for contemporary charts and graphs.

1768

William Playfair (Scotland) published *The Commercial Political Atlas*, a collection of 44 statistical charts.
One used bars to illustrate imports and exports.

1801–1805

Playfair published books that used circles to represent percentage breakdowns of whole numbers.

Pie charts from Playfair's Statistical Breviary (right) were published in 1801.

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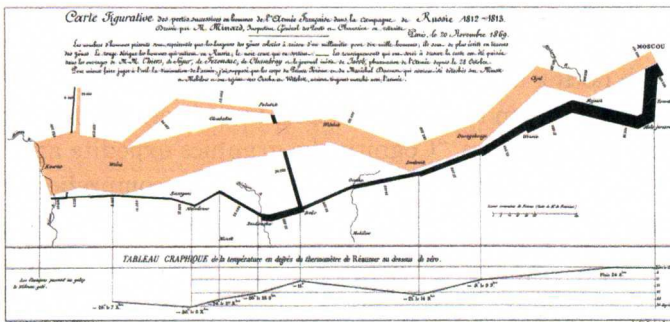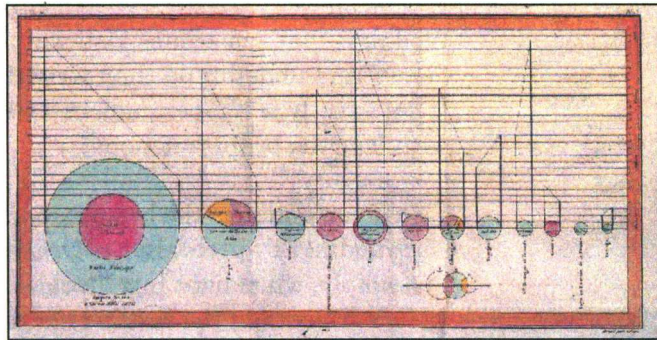
1861

Charles Joseph Minard (France) plotted the progression and recession of Napoleon's army as it invaded Russia in 1812. Minard illustrated six variables, including size, location, direction, time, and temperatures.

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What we see has a profound effect on our feelings, our actions, and even who we are. Thus, the ability of visual stimuli to communicate and influence is undeniable. In 1986, a study conducted at University of Minnesota School of Management and sponsored by 3M found presentations that include visual aids are 43 percent more effective in persuading audiences to take a desired course of action than those that don't.

Today, information graphics are found in textbooks, newspapers, magazines, print and broadcast advertisements, business reports, signs, product packaging, apps, websites, televisions shows, broadcast news, museums, restaurants, grocery stores, and more. Today, more and more professions rely heavily on information graphics to tell stories, inform, persuade, and educate. Why? Because the technology used to make information graphics is more accessible than ever before, and for as long as humans have walked the Earth, graphics resonate with us both cognitively and emotionally.

Visual perception and understanding

We know that sometimes visual stories are easier to consume, digest, and understand than written stories. But why is that? What exactly is happening when what the eyes see intersects with how the brain functions?

Visual perception is the brain's ability to make sense of its surroundings by processing information contained in visible light. Put simply, when light hits an object, some of the light is absorbed by its surface, and the rest is reflected away. As that light enters our eyes, it is filtered through photoreceptors that send electrical signals to the brain to stimulate cognitive processing.

It's also worth noting that the brain processes visual images about 60,000 times faster than text. According to visual communication consultant Mike Parkinson, "Cognitively, graphics expedite and increase our level of communication. They increase comprehension, recollection, and retention. Visual clues help us decode text and attract attention to information or direct attention, increasing the likelihood that the audience will remember."[1] At the same time, "pictures enhance or affect emotions and attitudes. Graphics engage our imagination and heighten our creative thinking by

THE POWER OF A VISUAL METAPHOR

In some cases, visual messages can be processed more efficiently and quickly than text. Likewise, visual metaphors often provide more clarity to complex concepts than verbal explanations. Of course, this doesn't lessen the importance of words. People still want to read good stories. However, information graphics – whether for print, broadcast, or the web – are a language of their own that, when used properly, can enrich storytelling in unique ways.
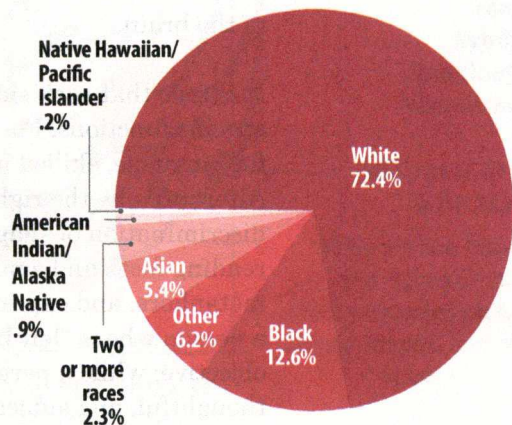
For example, a paragraph that breaks down the racial makeup of the United States by percentage is a pretty daunting read:

The 2010 U.S. Census recognized six ethnic and racial categories: White American (72.4%), Black or African American (12.6%), American Indian and Alaska Native (0.9%), Asian American (5.4%), Native Hawaiian or other Pacific Islander (0.2%), and people of more than one race (2.3%); a category of "other" (6.2%) was also included. The Census Bureau also classifies Americans as "Hispanic or Latino" and "Not Hispanic or Latino", which identifies them as a racially diverse ethnicity.

However, the same information presented as a pie chart like the one to the right paints a picture that is both easy to understand and efficient to consume. Without the visual aid, the numbers are less meaningful because they are more difficult to compare.

U.S. population by race

The United States has a racially and ethnically diverse population. The 2010 U.S. Census recognized six ethnic and racial categories.* Below shows the U.S. population by race.

Native Hawaiian/Pacific Islander .2%
American Indian/Alaska Native .9%
Two or more races 2.3%
Asian 5.4%
Other 6.2%
Black 12.6%
White 72.4%

*The Census Bureau also classifies Americans as "Hispanic or Latino" and "Not Hispanic or Latino", which identifies them as a racially diverse ethnicity.

Source: U.S. Census Bureau, Census 2000. Web: www.census.gov

stimulating other areas of our brain, which in turn leads to a more profound and accurate understanding of the presented material."

Things get really interesting when we begin to explore what's actually going on in your brain when you view an information graphic. A number of interrelated fields have researched connections between visual perception and understanding, including psychology, cognitive science, and neuroscience, to name