Why Your Organization Needs a Data Visualization Style Guide

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Please note that these slides have been edited from the original slide deck presented at the April 13, 2021 Data Visualization Meetup group.

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URBAN INSTITUTE

Disney
Urban Institute

Coca-Cola

https://fontmeme.com/coca-cola-font/
These fonts, colors, and shapes make brands visual and memorable.

∧

our data visualizations
1. Why have a style guide?
2. What should your style guide include?
3. How do you develop your style guide?
4. *Example:* Urban Institute style guide
Style Guide Collection

https://policyviz.com/2016/11/30/style-guides/

Bar Chart
- .25 pt. scale lines
- .75 pt. base line
- Either all horizontal or vertical axis lines
- Axis labels
1 Why have a style guide?
1

Make styles consistent & identifiable
A world of difference

GDP per person at PPP* and share of global population, 2014 forecast.

Sources: International Comparison Programme; IMF; The Economist

*Purchasing power parity
Most western countries are on the same coronavirus trajectory. Hong Kong and Singapore have managed to slow the spread.
Preferred Typefonts

Primary

Helvetica Light
ABCDefgh1234

Helvetica Light Italic
ABCDefgh1234

Helvetica Regluar
ABCDefgh1234

Helvetica Regular Italic
ABCDefgh1234

Helvetica Bold
ABCDefgh1234

Helvetica Bold Italic
ABCDefgh1234

Secondary

Times Roman Regular
ABCDefgh1234

Times Roman Regular Italic
ABCDefgh1234

Times Roman Bold
ABCDefgh1234

Times Roman Bold Italic
ABCDefgh1234

Optional Primary

Arial Regular
ABCDefgh1234

Arial Regular Italic
ABCDefgh1234

Arial Bold
ABCDefgh1234

Arial Bold Italic
ABCDefgh1234

Source: US Department of Agriculture

2

Make it easier for all staff to implement
Bar Chart

- .25 pt. scale lines
- .75 pt. base line
- Either all horizontal or vertical axis lines
- Axis labels

Source: Defense Intelligence Agency [left]; Dallas Morning News [right]

2 What should your style guide include?
http://urbaninstitute.github.io/graphics-styleguide/
# Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks

https://amzn.to/2zHQ4qv

<table>
<thead>
<tr>
<th>Region</th>
<th>Dept</th>
<th>Plan (US $)</th>
<th>Actual (US $)</th>
<th>Change (US $)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Operations</td>
<td>25,000</td>
<td>24,633</td>
<td>(167)</td>
<td>99.4</td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td>15,000</td>
<td>12,864</td>
<td>(2,136)</td>
<td>84.6</td>
</tr>
<tr>
<td></td>
<td>HR</td>
<td>20,000</td>
<td>23,098</td>
<td>3,098</td>
<td>109.2</td>
</tr>
<tr>
<td>East</td>
<td>Operations</td>
<td>8,000</td>
<td>8,010</td>
<td>10</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Contracts</td>
<td>14,000</td>
<td>12,495</td>
<td>(1,505)</td>
<td>86.8</td>
</tr>
<tr>
<td></td>
<td>Accounting</td>
<td>10,000</td>
<td>15,082</td>
<td>5,082</td>
<td>150.8</td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td>6,000</td>
<td>14,567</td>
<td>8,567</td>
<td>142.8</td>
</tr>
<tr>
<td></td>
<td>Sales</td>
<td>43,000</td>
<td>47,653</td>
<td>4,653</td>
<td>110.8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>136,000</td>
<td>153,241</td>
<td>17,241</td>
<td>127.6</td>
</tr>
</tbody>
</table>

Note: Includes all operations except those in Richmond, V.A.
Typography

Consistency Style Guide

Chart Titles & Legends
Use chart titles to convey what's being displayed in the graph. This is also a good place to position your key metrics (which means you can remove it from the axis).
Use the subtitle space as a colour legend when applicable.

Chart Title (12pts)
Chart Subtitle (10pts)
Thing 1
Thing 2
10pts Bold

Fonts
Your dashboard should have "Reith Sans" throughout.
Your default font in the style guide is sized to 10pts, but be aware that font sizes below 12 points will be difficult to read.

Axis Fonts
The emphasis on your axes will vary, but where possible de-emphasise axes text by reducing size (11pts) and / or reduce shading (to #999999).

Alignment
As a rule of thumb, align your text so that it is closer to the data (especially useful for bar charts and tables).

Type Dynamics
You can achieve a lot by using variations in text size on your dashboard.

More Ink = More Emphasis
Good for KPIs and callouts

Did you mean?
Good for de- emphasising information

Contact the team

Source: BBC

https://public.tableau.com/profile/bbc.audiences#!/vizhome/BBCAudiencesTableauStyleGuide/Hello
Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks
https://amzn.to/2zHQ4qv

https://spectrum.adobe.com/page/table/#Use-tabular-numbers-for-numerical-data
Colors

Color schemes

The following sets of colors maintain CFPB brand cohesion and create accessible graphics.

Main colors

<table>
<thead>
<tr>
<th>English</th>
<th>Hex code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cream</td>
<td>#EDEAC7</td>
</tr>
<tr>
<td>Red</td>
<td>#C81028</td>
</tr>
<tr>
<td>Green</td>
<td>#46820F</td>
</tr>
<tr>
<td>Blue</td>
<td>#0036F6</td>
</tr>
<tr>
<td>Black</td>
<td>#000000</td>
</tr>
<tr>
<td>Yellow</td>
<td>#F3C50B</td>
</tr>
</tbody>
</table>

Secondary colors

<table>
<thead>
<tr>
<th>English</th>
<th>Hex code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beige</td>
<td>#F0E7D8</td>
</tr>
<tr>
<td>Purple</td>
<td>#9C00FF</td>
</tr>
<tr>
<td>Orange</td>
<td>#F3790B</td>
</tr>
<tr>
<td>Pink</td>
<td>#FF006F</td>
</tr>
<tr>
<td>Pinkish</td>
<td>#FF007F</td>
</tr>
<tr>
<td>Brown</td>
<td>#8B4513</td>
</tr>
<tr>
<td>Silver</td>
<td>#C0C0C0</td>
</tr>
</tbody>
</table>

Source: Consumer Finance Protection Bureau

https://cfpb.github.io/design-system/?utm_source=designmanual&utm_medium=redirect&utm_campaign=design systemlaunch
https://twitter.com/WhiteHouseCEA45/media
Discussion of this graph: https://policyviz.com/2021/02/15/the-ten-most-misleading-charts-during-donald-trumps-presidency/
Chart Design

**CHART DESIGN**

**STYLING & LAYOUT**

Consistent layout, labels & lines

For ease of comprehension, it's important that your charts are presented consistently, and are as clean and uncluttered as possible.

A descriptive chart title in 18pt Bold #353642

More detailed explanation matching the document body copy in 14pt

![Image of a chart with consistent styling and layout]

Source: Mike Brandbjerg of the Greater London Authority

Remember, your charts should fit part of the document they are displayed within, and so font sizes should relate to the document text hierarchy and all chart text should be consistent across the document.

Shown are typical font and line weight settings derived from the London Datastore’s body copy. Depending on your tools, device/document context and application, you may want to change the specific settings, but the relative relationships between font & type settings should be similar.

A descriptive chart title in 18pt Bold #FFFFFF

More detailed explanation matching the document body copy in 14pt

![Image of another chart with consistent styling and layout]

Source: Mike Brandbjerg of the Greater London Authority

https://data.london.gov.uk/blog/city-intelligence-data-design-guidelines/
Chart Parts (+ Tables!)

- Resources List
- Templates & Exporting Options
- Diversity, Equity, & Inclusion
- Accessibility & Alt Text Rules
- Typography
- Color Palette
- Chart Design
Accessibility – Color Vision Deficiencies

https://www.color-blindness.com/coblis-color-blindness-simulator/
https://www.vischeck.com/vischeck/
https://www.colororacle.org/

Other tools:
https://color.adobe.com/create/color-accessibility
https://projects.susielu.com/viz-palette
https://www.colourblindawareness.org/
http://zapmap.com/colors/
Accessibility – Broadband Gaps

See also Jacob’s Law: https://lawsofux.com/jakobs-law/

Accessibility – Alt Text

alt="Chart type of type of data where reason for including chart"

Include a link to data source somewhere in the text

https://medium.com/nightingale/writing-alt-text-for-data-visualization-2a218ef43f81

See also Accessibility Weekly Newsletter:
https://a11yweekly.com/
Paper on OSF: https://osf.io/x8tbw/

See also Data Feminism: https://amzn.to/32gbhD4
## Diversity, Equity, & Inclusion

### 9. What is Person’s Race?

Mark **all** boxes for the race categories that apply to the person. Please note that an individual may identify as belonging to more than one race.

<table>
<thead>
<tr>
<th>Race Category</th>
<th>Example(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Print for example, German, Irish, English, Italian, Latvian, Japanese, etc.</td>
</tr>
<tr>
<td>Black or African Am.</td>
<td>Print for example, African American, Jamaican, Haitian, Nigerian, African, etc.</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>Print name of specific or principal tribe(s), for example, Navajo Nation, Blackfeet Tribe, Marsh, Aztec, Navajo Village of Black Rock Traditional Government, Namie Edmine Community, etc.</td>
</tr>
<tr>
<td>Chinese</td>
<td>Vietnamese</td>
</tr>
<tr>
<td>Filipino</td>
<td>Korean</td>
</tr>
<tr>
<td>Asian Indian</td>
<td>Japanese</td>
</tr>
<tr>
<td>Other Asian</td>
<td>Print for example, Bhutanese, Cambodian, Chinese, Hmong, etc.</td>
</tr>
<tr>
<td>Some other race – Print race or origin.</td>
<td></td>
</tr>
</tbody>
</table>

**Blog post:** https://urban-institute.medium.com/applying-racial-equity-awareness-in-data-visualization-bd359bf7a7ff  
**Paper on OSF:** https://osf.io/x8tbw/  

See also *Data Feminism*: https://amzn.to/32gbhD4
BBC Visual and Data Journalism cookbook for R graphics
Last updated: 2015-01-24

How to create BBC style graphics
At the BBC data team, we have developed an R package and an R cookbook to make the process of creating publication-ready graphics in our in-house style using R's ggplot2 library a more reproducible process, as well as making it easier for people new to R to create graphics.

The cookbook below should hopefully help anyone who wants to make graphics like these:

https://bbc.github.io/rcookbook/
BBC AUDIENCES TABLEAU STYLE GUIDE

1. If you're looking at this you're likely to be one of our Tableau Desktop users. This style guide is here to help you achieve consistent user experiences, help you make effective visualisations and make your visualisation a part of the high-quality output of the CONSISTENT USER EXPERIENCES

2. There's always hundreds of different ways of doing things in Tableau. But for the people using your dashboards, figuring out how to get to the information they want should be quick, easy and intuitive. The aim of this guide is help you design dashboards that embrace this.

DATA VISUALISATION THAT COMMUNICATES EFFECTIVELY

3. We want to provide you with a consistent approach to making decisions while designing your visualisations. We want to make sure that your data narratives come through loud and clear. And we want you to be confident in making dashboards and visualisations that tell the BBC about its many audiences.

A VISUAL LANGUAGE THAT'S A MARK OF QUALITY

4. We're using a language that helps our users recognise the high-quality output that goes into producing complex data narratives - a BBC Audience Dashboard should inevitably be a recognizable member of that family.

Source: BBC

Templates

https://urban-institute.medium.com/applying-urbans-styles-in-excel-44707fbf2b75
Graphing Styles Add-in from Peltier Tech and PolicyViz


150+ Color palettes in Excel:
https://policyviz.com/2017/01/12/150-color-palettes-for-excel/

Create custom color palettes in Tableau:
Resources List

Books

Blogs

Tools
How do you develop your style guide?

Ben Chartoff: Urban Institute’s Data Visualization Style Guide: A living document
Get input from all sides: design, analysis, dataviz, marketing,...

Ben Chartoff: Urban Institute’s Data Visualization Style Guide: A living document
https://policyviz.com/2015/04/16/communicating-research-build-a-unicorn-dont-look-for-one/
2

Iterate and treat as a living document
As our team grows and learns, we will continue to adapt and update it, striving to make our charts more legible, more beautiful, scalable across more platforms, and accessible to all.

— Ben Chartoff

4 Example: Urban Institute style guide
URBAN INSTITUTE DATA VISUALIZATION STYLE GUIDE

Use this data visualization style guide to create a uniform look and feel to all of Urban's charts and graphs. This site contains guidelines that are in line with data visualization best practices and proven design principles. It also eliminates the burden of design and color decisions when creating charts.

These guidelines are primarily for publishing charts to the website. Minor sizing and typographic adjustments need to be made to insert charts into documents.
The Urban Institute is the trusted source for unbiased, authoritative insights that inform consequential choices about the well-being of people and places in the United States.

We are a nonprofit research organization that believes decisions shaped by facts, rather than ideology, have the power to improve public policy and practice, strengthen communities, and transform people’s lives for the better.

https://www.urban.org/
https://urban-institute.medium.com/applying-urbans-styles-in-excel-44707fbf2b75
Excel vs. R

Excel (print) vs. R

https://github.com/UrbanInstitute/urbnthemes
library(tidyverse)
library(urbanthemes)

set_urban_defaults(style = "print")

ggplot(data = mtcars, mapping = aes(factor(cyl))) +
  geom_bar() +
  scale_y_continuous(expand = expansion(mult = c(0, 0.1))) +
  labs(x = "Number of Cylinders",
       y = "Count") +
  remove_ticks() +
  labs(title = "Most Cars Have 8 Cylinders",
       subtitle = "1974 Motor Trend US magazine")

Source: https://github.com/UrbanInstitute/urbanthemes
1 Why have a style guide?
1. Make styles consistent & identifiable
2. Make it easier for all staff to implement
What should your style guide include?
3. How do you develop your style guide?
1. Get input from all sides: design, analysis, dataviz, marketing,...

2. Iterate and treat as a living document
Be consistent.
Be targeted.
Be thorough.
Be inclusive.
Be receptive.

Jon Schwabish | @jschwabish
Resources & Further Reading

Adèle: The repository of publicly available design systems and pattern libraries, https://adèle.usipin.com/
Amy Cusil: Why does Data Viz need a style guide? (OpenVisConf talk, 2017), https://www.youtube.com/watch?v=O4QNP8PcQH0
Amy Cusil: What are DataViz Style Guides?, https://medium.com/@nightingale/style-guidelines-92b6a56d9d6c
Amy Cusil: Writing Alt Text for Data Visualization, https://medium.com/@nightingale/writing-alt-text-for-data-visualization-2c2218e5f81

Data Visualization Society: Style Guidelines Collection, https://www.datavisualizationsociety.com/resources