BUAN 3500: Descriptive Analytics and Data Visualization

Dashboards

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Dashboards

What is a dashboard?

Definition

A dashboard is a visual display of data used to monitor conditions and/or facilitate understanding.[a]

[a] Wexler, Shaffer, Cotgreave. (2017). *The Big Book of Dashboards*. Hoboken, New Jersey: Wiley.

Dashboards

We're going to use Tableau to create dashboards.

- **Tableau Public:**

  https://public.tableau.com/app/discover

- **Viz of the Day:**

  https://public.tableau.com/app/discover/viz-of-the-day

- **Real-World Examples of Business Intelligence (BI) Dashboards:**

  https://www.tableau.com/learn/articles/business-intelligence-dashboards-examples

Dashboards

Example

Austin Animal Center Intakes:

Download the dataset at the following link:

https://bit.ly/3OANoxD

We're going to see how to use Tableau to create a Dashboard and upload it to Tableau Public.

Dashboards

Warning!

Do not publish to Tableau Public with data that should not be shared!

Dashboards

Well-designed dashboards deliver information that is:[a]

- Exceptionally well organized
- Condensed, primarily in the form of summaries and exceptions
- Specific to and customized for the dashboard's audience and objectives
- Displayed using concise and often small media that communicate the data and its message in the clearest and most direct way possible

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[a] Few, Stephen. (2006). *Information Dashboard Design*. O'Reilly Media, Inc.

Dashboards

"Dashboards tell people what's happening and should help them immediately recognize what needs their attention."[1]

[1] Few, Stephen. (2006). *Information Dashboard Design*. O'Reilly Media, Inc.

Dashboard

Something important to consider when creating dashboards (and and data visualizations):

$\rightarrow$ COLOR!

(Photo by Dee @ Copper and Wild on Unsplash)

Dashboards

The Use of Color in Data Visualization:[2]

- **Sequential**
- **Diverging**
- **Categorical**
- **Highlight**
- **Alert**

Let's look at examples of these uses of color.

[2]Wexler, Shaffer, Cotgreave. (2017). *The Big Book of Dashboards*. Hoboken, New Jersey: Wiley.

Dashboards

- **Sequential:**
  - `https://bit.ly/4bDrX9O`
- **Diverging:** This dashboard uses diverging color: coloring:
  - `https://bit.ly/3KSANVp`

Dashboards

- **Categorical:**
  - `https://bit.ly/3P8OoL5`
  - `https://bit.ly/44md2fi`
- **Highlight:** used when there is something that needs to stand out to the reader (but not alert or alarm them)
  - `https://bit.ly/3shWs2R`
  - `https://bit.ly/45G9Jka`
- **Alert:** Alerting color is used when there is a need to draw attention to something for the reader.
  - In a case like this, it's often best to use bright, alarming colors.

Dashboards

Something to consider: Color Vision Deficiencies (CVD)

- approximately 8% of males have CVD
- approximately 0.4% of females have CVD
- ("This is caused by a lack of one of three types of cones within the eye needed to see all color"[3])

[3]Wexler, Shaffer, Cotgreave. (2017). *The Big Book of Dashboards*. Hoboken, New Jersey: Wiley.

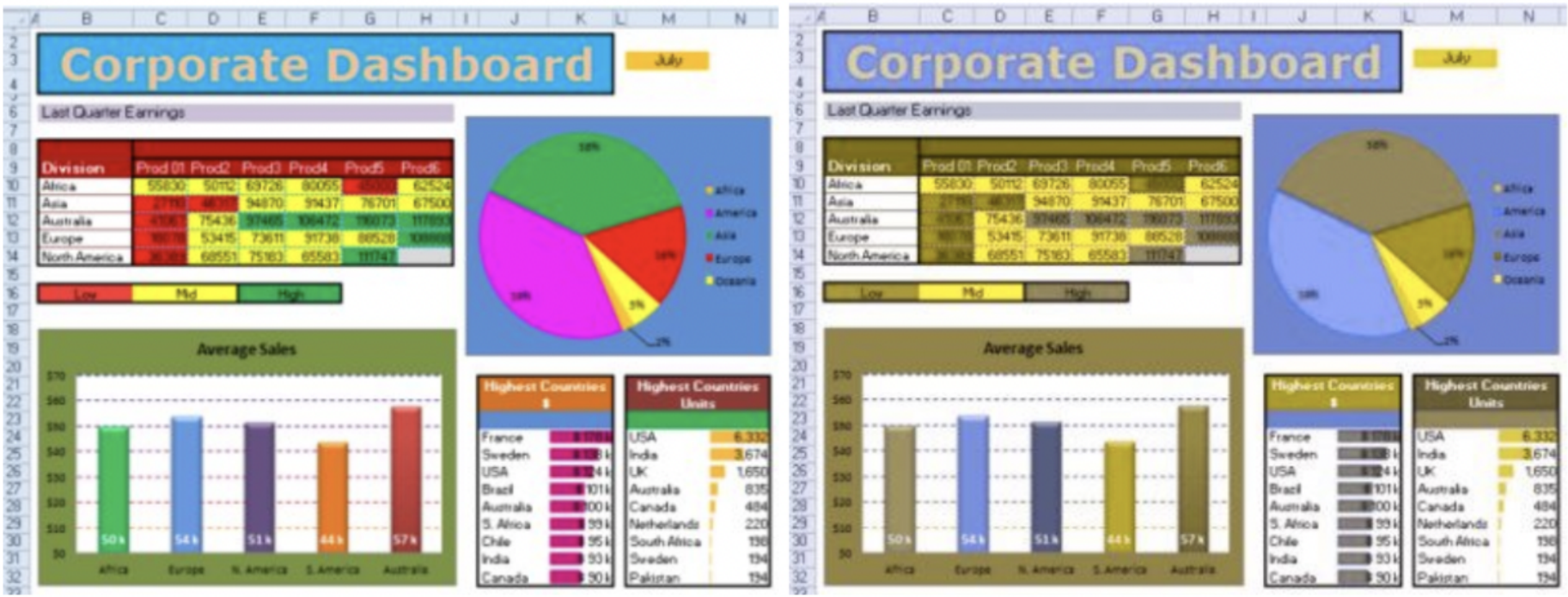
Dashboards

Three types of CVD:

- **Protanopia**
  lack of long-wave cones (red weak)
- **Deuteranopia**
  lack of medium-wave cones (green weak)
- **Tritanopia**
  lack of short-wave cones (blue)

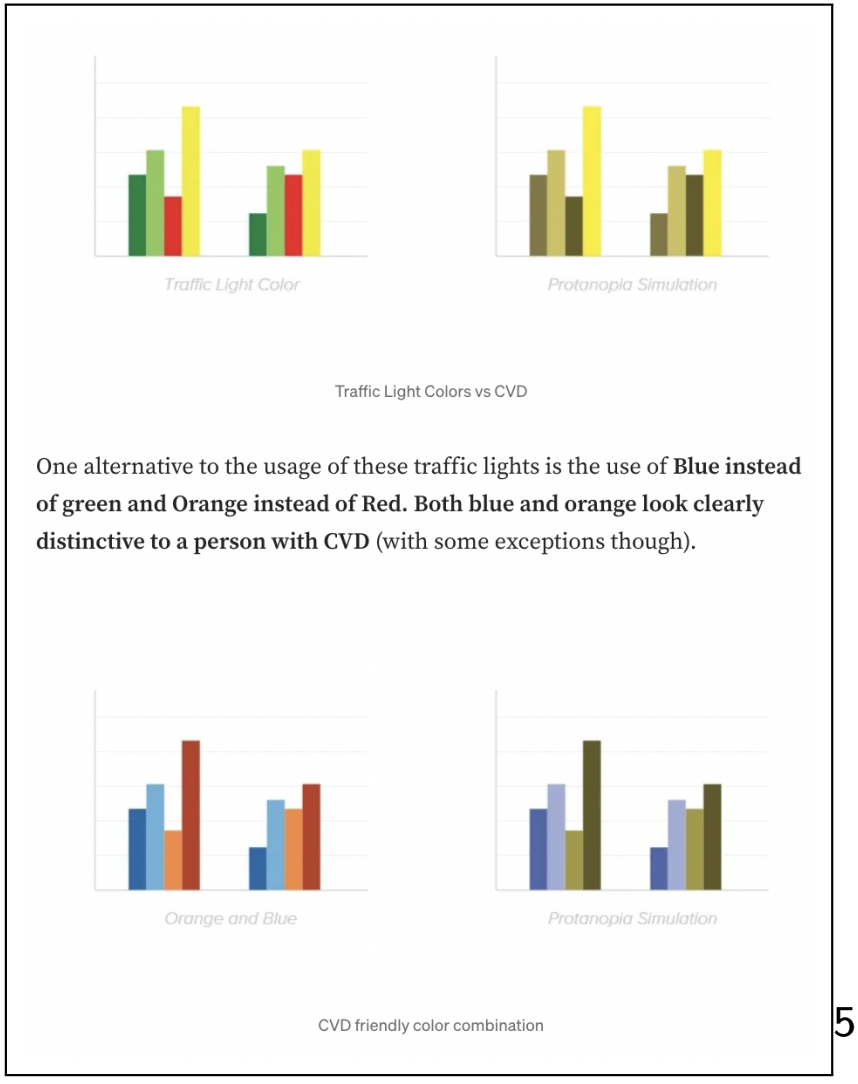
Dashboards

How a dashboard might look to someone with Protanopia:



[4] https://www.storytellingwithdata.com/blog/2018/4/23/accessibility-considerations-for-visuals

Dashboards



[5], [6]

[5] https://uxdesign.cc/creating-dashboards-for-the-color-blind-74d62d67547

[6] Wexler, Shaffer, Cotgreave. (2017). *The Big Book of Dashboards*. Hoboken, New Jersey: Wiley.

Dashboards

Red, green, and orange can all appear brown for someone with strong CVD
$\rightarrow$ avoid using red, green, brown, and orange together

Tips:

https://www.tableau.com/blog/examining-data-viz-rules-dont-use-red-green-together

Dashboards

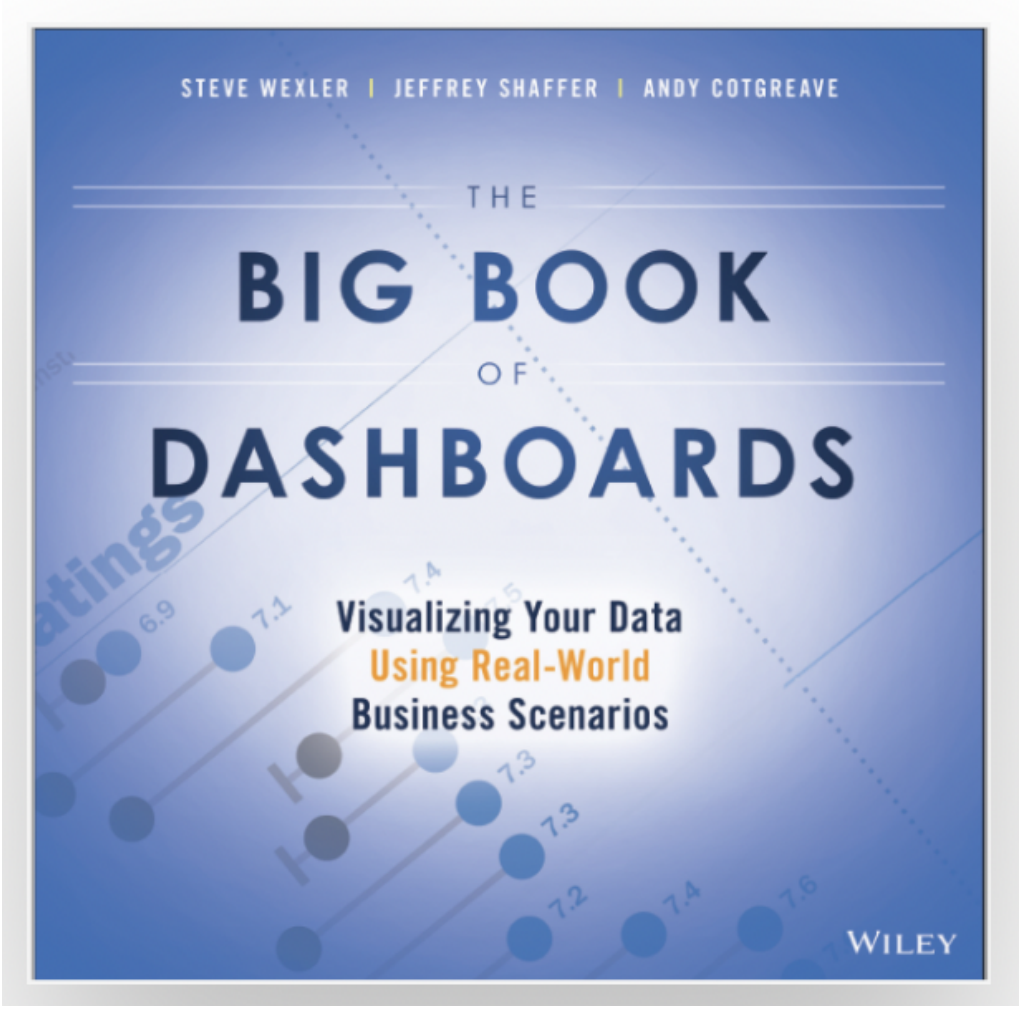
Potential resources:

- **Chromatic Vision Simulator (free)**
- **NoCoffee vision simulator (free)**

I have not used these resources, but they allow users to simulate how images and/or websites would appear to people with different forms of CVD. (There are many other resources like this!)

Dashboards

"The Big Book of Dashboards, Visualizing Your Data Using Real-World Business Scenarios"
by Steve Wexler, Jeffrey Shaffer, and Andy Cotgreave:



Dashboards

Let's look at some examples from "The Big Book of Dashboards":

https://www.bigbookofdashboards.com/dashboards.html

Dashboards

Some Common Mistakes in Dashboard Design:[7]

- Exceeding the boundaries of a single screen
- Supplying inadequate context for the data
- Displaying excessive detail or precision
- Choosing a deficient measure
- Choosing inappropriate display media
- Introducing meaningless variety
- Using poorly-designed media

(Continued on next slide)

[7] Few, Stephen. (2006). *Information Dashboard Design*. O'Reilly Media, Inc.

Dashboards

Some Common Mistakes in Dashboard Design:[8]

- Encoding quantitative data inaccurately
- Arranging the data poorly
- Highlighting important data ineffectively or not at all
- Cluttering the display with useless decoration
- Misusing or overusing color
- Designing an unattractive visual display

This webpage has some examples illustrating these common design mistakes:

https://datazuum.com/top-13-dashboard-design-mistakes/

[8] Few, Stephen. (2006). *Information Dashboard Design*. O'Reilly Media, Inc.

Dashboards

Example

The file "NewHouseSalesUS.xls" on Canvas contains data for new, privately-owned, residential housing units sold and for sale in the United States between 2002 to the present. (This file can also be found at https://www.census.gov/construction/nrs/data/series.html.)
Use Tableau to create a Dashboard communicating any aspects of this data that you choose.

Dashboards

Example

The file "libraries.csv" on Canvas contains data about Denver Public Libraries within the City and County of Denver. The data includes patronage and circulation for the previous calendar year. (This file can also be found at https://www.denvergov.org/opendata/dataset/city-and-county-of-denver-libraries.)
Use Tableau to create a Dashboard or "Story" communicating any aspects of this data that you choose.

Dashboards

Power BI:

Another commonly-used tool for data visualization is a Microsoft product called Power BI. ("BI" stands for "Business Intelligence".)

In your UCCS Microsoft 365 account you should have access to Power BI.

In this class we focus on Tableau for creating Dashboards, but Power BI is another good tool.