ITI0209: User Interfaces

15. Visualizations Continued. Dashboards

Martin Verrev

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Data are facts.

Information is the meaning that human being assigns to these facts.

Let's Recap:

Good graphs should **tell a story** and **be memorable**, but also have a **low information to ink ratio** and **not mislead** the viewer.

Choice of colour when designing charts and graphs is also important to allow for colour blindness and black and white printing.

Data Visualization Workflow: 1/6

Understand the context. Who? What? How

Therefore, the first lesson is to understand the context and then embarking on your journey of utilizing the data as per the understood context.

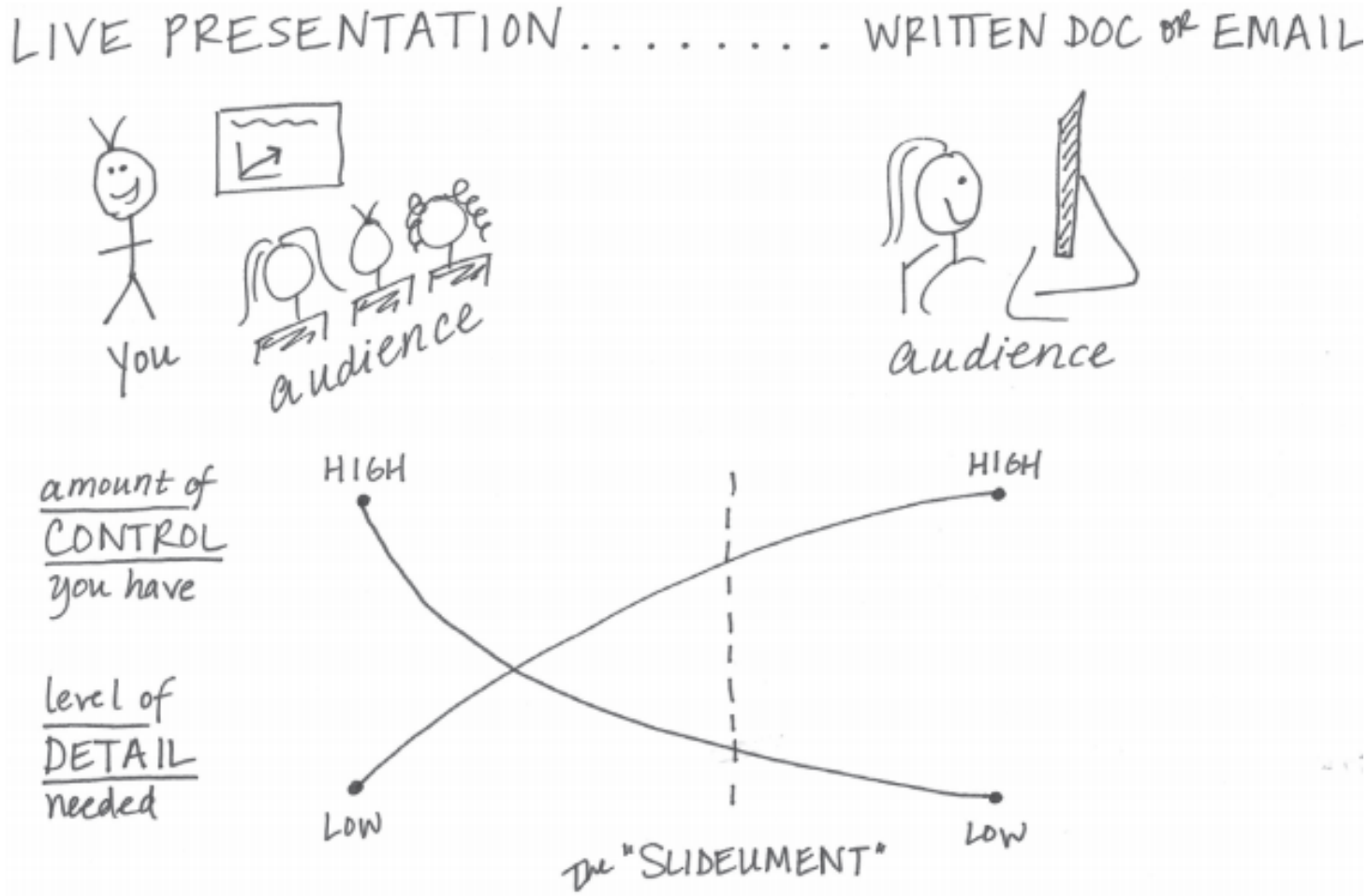


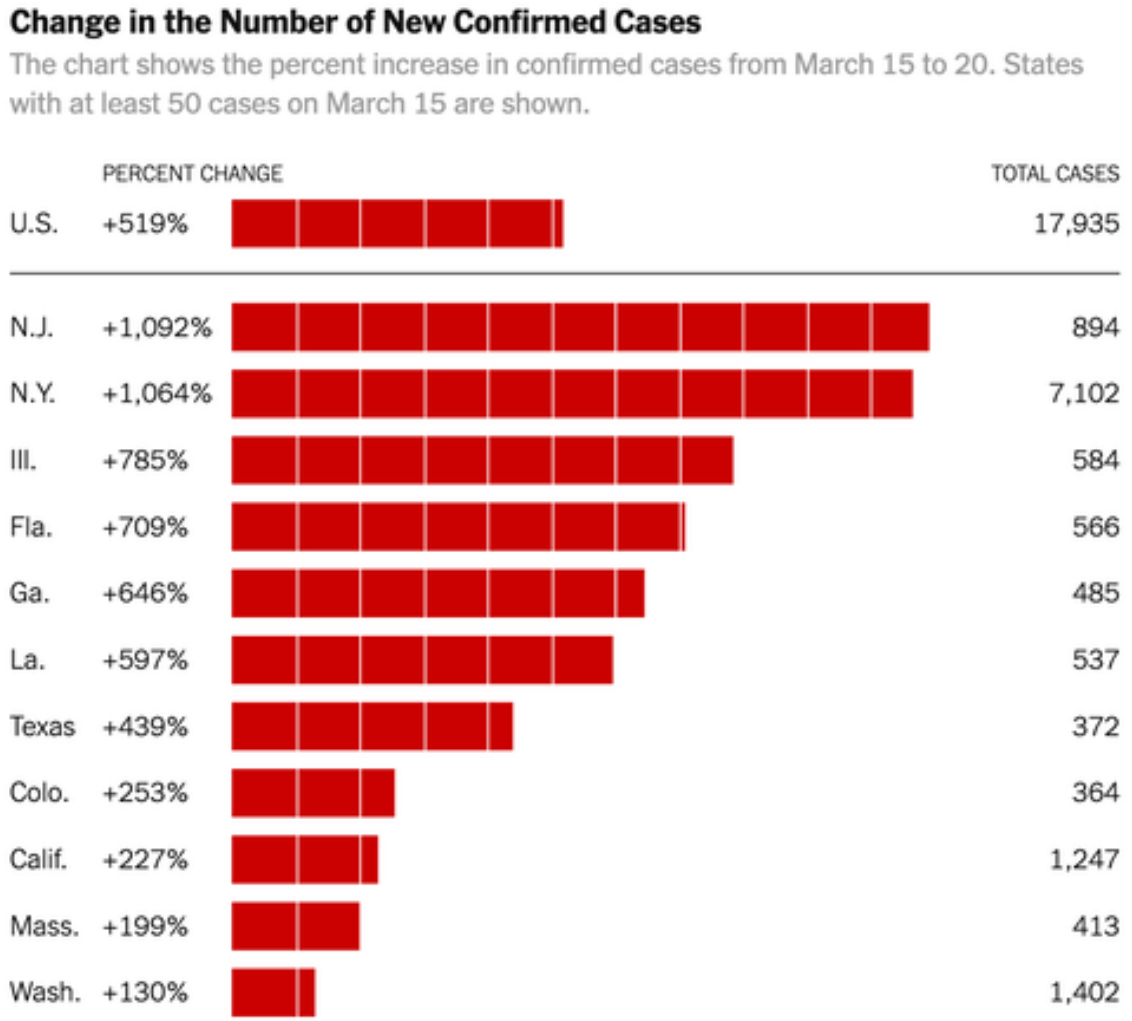
FIGURE 1.1 Communication mechanism continuum

Data Visualization Workflow: 2/6

Choose an appropriate visual display

We covered it during the previous class :)

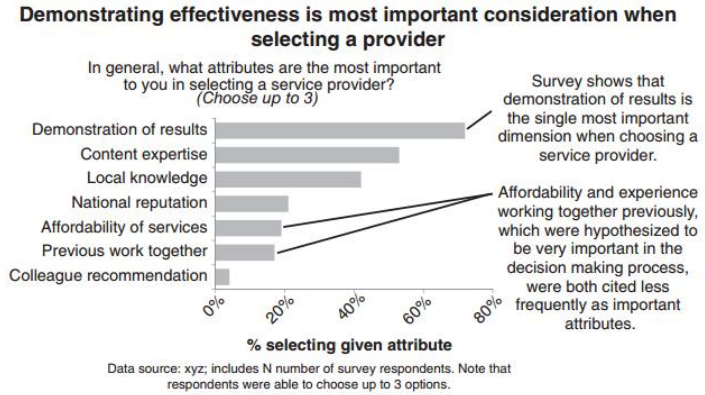
(Nussbaumer, p36)

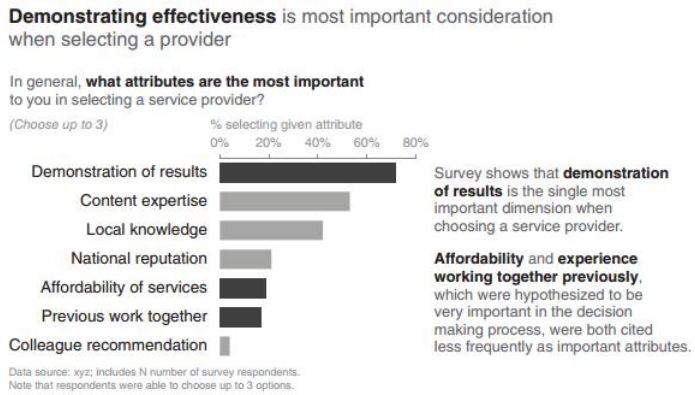


Data Visualization Workflow: 3/6

Eliminate clutter

Clutter is visual elements that take up space but don’t increase understanding.



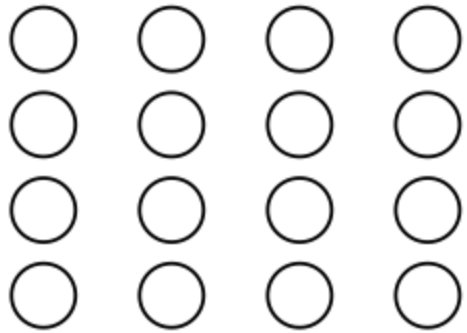


Data Visualization Workflow: 4/6

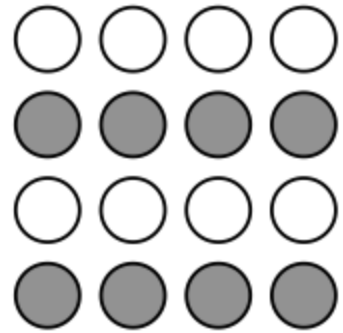
Focus attention where you want it

- **Proximity** is that human tendency to think physically close object as belonging to the same group.
- **Similarity** means that, objects that are of similar colour, shape, size, or orientation are perceived as related or belonging to part of a group.
- **Enclosure:** we think of objects that are physically enclosed together as belonging to part of a group. Furthermore, humans like simplicity rather than complexity:
- **Continuity** is the human tendency to seek the most smooth path and even create one even if explicitly no such continuity exists.

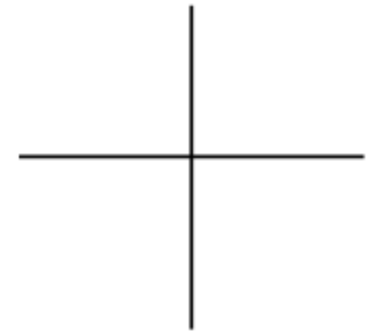
proximity



similarity

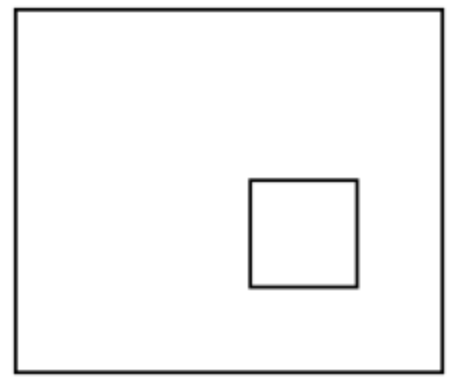


continuity

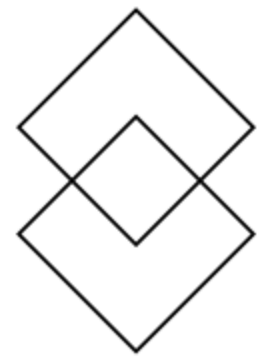


closure

area



symmetry



Data Visualization Workflow: 5/6

Think like a designer .. and above all else show data.

Graphical elegance is often found in simplicity of design and complexity of data.

20.3
15.2
14.6
11.3
10.1
8.4
5.1
81
123
182
227
255
291
357

Friendly vs Unfriendly Data Graphics

(Tufte. p183)

More Tips. Friendly Graphs

- Words are spelled out
- Words run from left to right
- Little messages help explain data
- Shadings, hatches and colors are avoided. - Labels are placed on graphics itself, so no legend is required
- Graphics attract viewers
- Colors are chosen so color blind can read them
- Type is clear and precise
- Type is upper and lowercase

More tips. Unfriendly Graphs

- Use of abbreviations
- Words run vertically, particularily along y-axis. Words run in differnet directions
- Graphic is cryptic and needs repeated references to scattered text
- Obscure codings need to go back to legend and graphic
- Chartjunk
- Design insensitive to color defunct
- Type is overbearing
- Type is all capitals

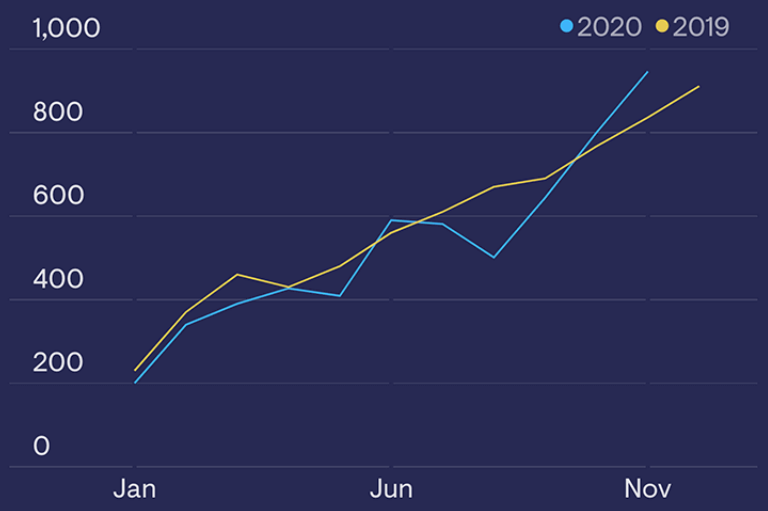
Data Visualization Workflow: 6/6

Tell a story

3-minute story: if you had only three minutes to tell your audience what they need to know, what would you say?’

Therefore it is important to understand the context and then embarking on your journey of utilizing the data as per the understood context.

New customers

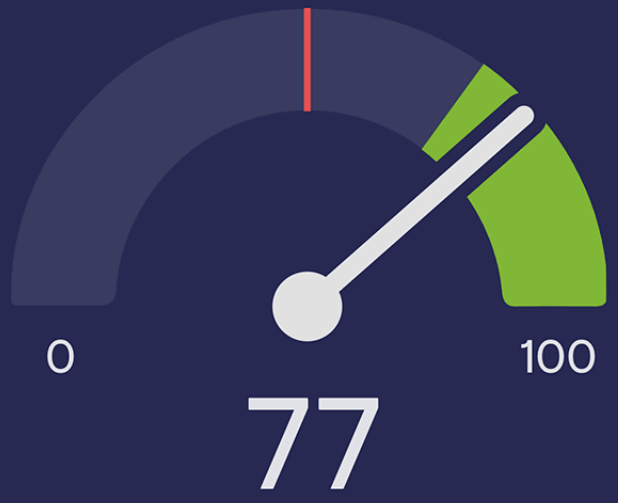


$1,773

New MRR today

▲ $827 Vs yesterday

Satisfaction



HR this month

Corporate hires	20
Ops hires	10
Executive hires	5
Engineering hires	10

Customers

Recent orders

Category	Destination	Cost	Gross margin
Biological	Europa	$1,407.00	$169.40
Mineral	Triton	$65.70	$1.30
Biological	Triton	$173.20	$14.80
Biological	Mars	$310.90	$3.70
Biological	Mercury	$296.90	$57.70
Mineral	Europa	$526.40	$161.70
Mineral	Triton	$17.70	$2.30
Equipment	Moon	$26.10	$4.90
Equipment	Mars	$37.40	$1.10
Mineral	Moon	$10.80	$4.10
Mineral	Titan	$71.40	$12.00

Latest customer

Union Aerospace Corporation

Excel dashboard Powered by Geckoboard

14:04

Dashboards often provide at-a-glance views of key performance indicators (KPIs) relevant to a particular objective or business process. For example, a manufacturing dashboard may show numbers related to productivity. Similarly, a human resources dashboard may show numbers related to staff recruitment, retention and composition.

The term dashboard originates from the automobile dashboard where drivers monitor the major functions at a glance via the instrument cluster.

10 Steps for Building the Dashboard

1. Ask questions
2. Follow the design basics (we go over the principles on next slides)
3. Choose the right tools
4. Determine the audience
5. Develop the metrics
6. Determine the levels of data
7. Design the display
8. Delivery, training and feedback

An Effective Dashboard Shoud

- Be viewed on a single one-page display screen (no scrolling required).
- Feature three to seven metrics.
- Present data that is as close to real as possible.
- Include metrics that can be affected by users of the system.
- Be simple and easy to read with minimal text.
- Eliminate the need for paper reports.

An Effective Dashboard Should Not

- Be everything to everyone.
- Have more than seven metrics.
- Require scrolling to view the main metrics.
- Contain a lot of text.
- Remove the need for detail reports.

Inspiration

- Data is Beautiful Subreddit. https://www.reddit.com/r/dataisbeautiful/
- Data is Ugly Subreddit. https://www.reddit.com/r/dataisugly/
- Information is Beautiful. https://informationisbeautiful.net/
- Beautiful News. https://informationisbeautiful.net/beautifulnews/
- 10 Of The Best Data Visualization Examples From History & Today. https://www.tableau.com/learn/articles/best-beautiful-data-visualization-examples

Books

- Edward R. Tufte. The Visual Display of Quantitative Information. Graphics 2001. https://www.goodreads.com/book/show/17744.The_Visual_Display_of_Quantitative_Information?ac=1&from_search=true&qid=cMoP2LwLen&rank=1
- Cole Nussbaumer Knaflic. Storytelling with Data: A Data Visualization Guide for Business Professionals. Wiley 2015. https://www.goodreads.com/book/show/26535513-storytelling-with-data

References

- The beauty of data visualization - David McCandless. https://www.youtube.com/watch?v=5Zg-C8AAIGg
- The Gospel According to Tufte. http://www-personal.umich.edu/~jpboyd/eng403_chap2_tuftegospel.pdf
- 30 Handpicked Excellent Dashboards. https://medium.muz.li/30-handpicked-excellent-dashboards-347e2407a057
- Big Book of Dashboards: http://www.bigbookofdashboards.com/dashboards.html
- Graphical Integrity and Redesign. http://jcsites.juniata.edu/faculty/rhodes/ida/graphicalIntRedes.html

Thank you!