



Data Storytelling – What Makes a Good Vis Good?

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The best design gets out of the way
between the viewer's brain and the content.

-Edward Tufte

But First... Some History

William Playfair (1759 – 1823)

Engineer, Political Economist,
Statistician, Secret Agent



William Playfair
(1759 – 1823)

Engineer, Political Economist, Statistician, Secret Agent

Apprenticed with [Andrew Meikle](#), worked as PA to [James Watt](#)

Stormed the Bastille

"Shady" land deals in Ohio

Questionable 'securities bank' in London

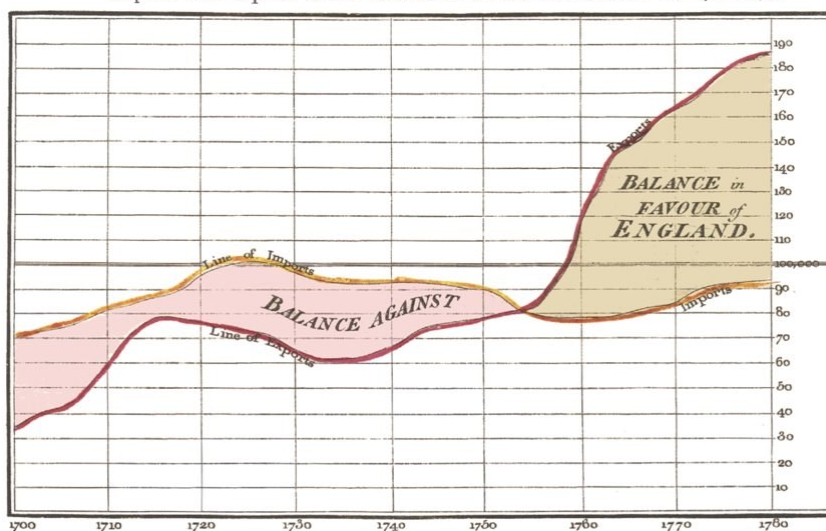
Destabilised French government with a secret agent counterfeiting mission

Andrew Meikle (5 May 1719 – 27 November 1811) was a Scottish mechanical engineer credited with inventing the threshing machine, a device used to remove the outer husks from grains of wheat.

James Watt FRS FRSE (/wɒt/; 30 January 1736 (19 January 1736 OS) – 25 August 1819)[1] was a Scottish inventor, mechanical engineer, and chemist who improved on

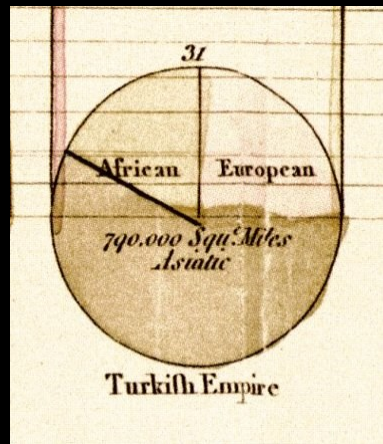
Thomas Newcomen's 1712 Newcomen steam engine with his Watt steam engine in 1776, which was fundamental to the changes brought by the Industrial Revolution in both his native Great Britain and the rest of the world

Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780.



The Bottom line is divided into Years, the Right hand line into £10,000 each.
 Published as the Act directs, 1st May 1786. by W^m Playfair. *Scale enlarged 352 Strand, London.*

William Playfair (1759 – 1823)



William Playfair (1759 – 1823)

Charles Joseph Minard

(1781 – 1870)

Civil Engineer, Statistician



Portrait: [Charles Joseph Minard and the Art of Infographics - SciHi Blog](#)

Charles Joseph Minard
(1781 – 1870)

Civil Engineer, Statistician

Designed dams, canals & bridges throughout Europe

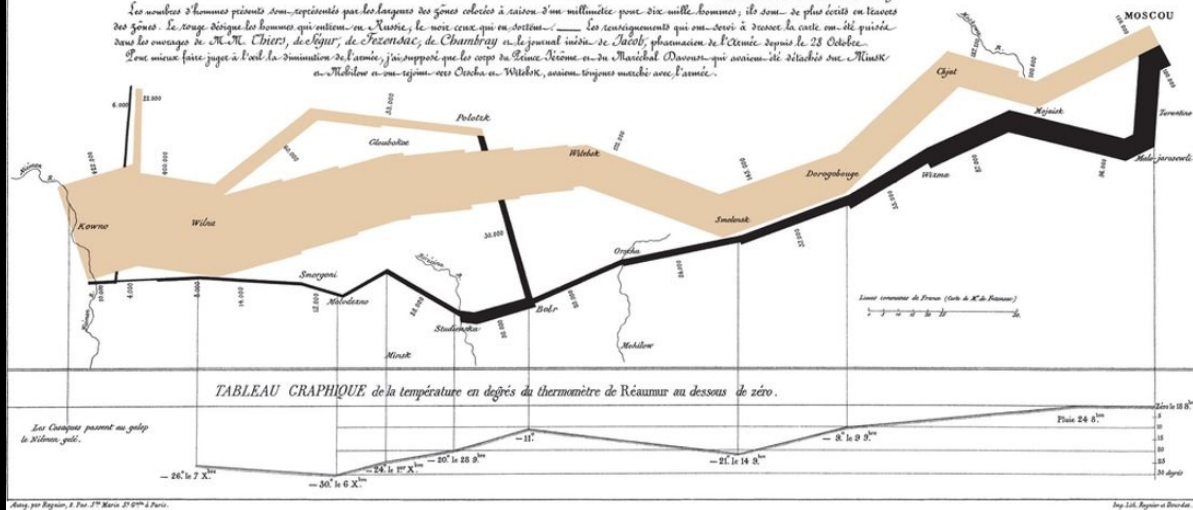
Modelled railway passenger and freight traffic

Leader in thematic maps and cartographical presentation of numerical data

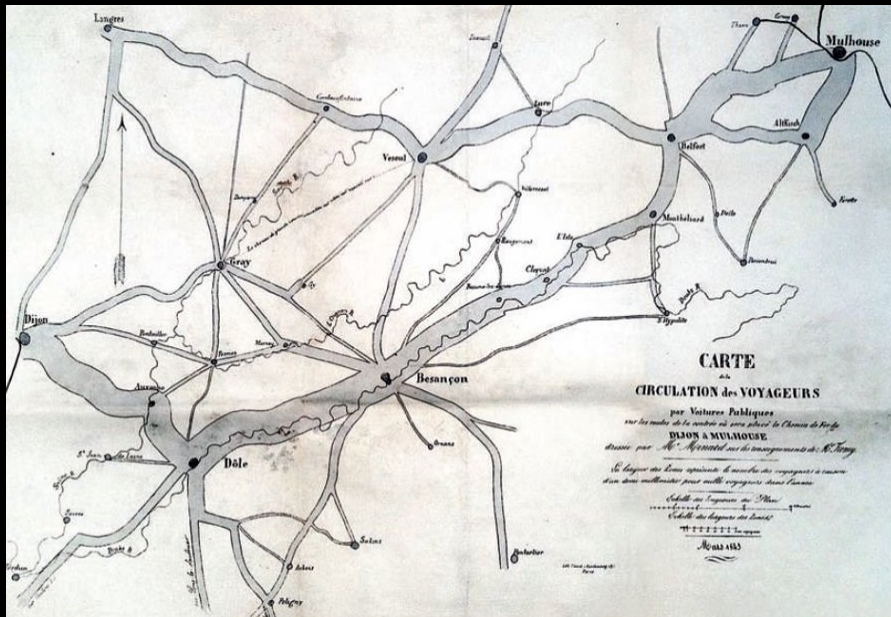
Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

Dessiné par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite, Paris, le 20 Novembre 1869.

Les nombres d'hommes présents sont représentés par les longueurs des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en lettres des zones. Le rouge désigne les hommes qui entrent en Russie; le noir ceux qui en sortent. Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M. M. Thiers, de Ségur, de Fozzard, de Chambray et le journal inédit de Napoléon, pharmacien de l'Armée depuis le 28 Octobre. Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davoust qui avaient été détachés sur Minsk et Mielnoe n'en rejoignent pas Oescha ou Wilna, ainsi qu'on le voit avec l'armée.



Charles Joseph Minard(1781 – 1870)



Charles Joseph Minard(1781 – 1870)

Florence Nightingale (1820 – 1910)

Social Reformer, Writer, Statistician



Florence Nightingale
(1820 – 1910)

Social Reformer, Writer, Statistician

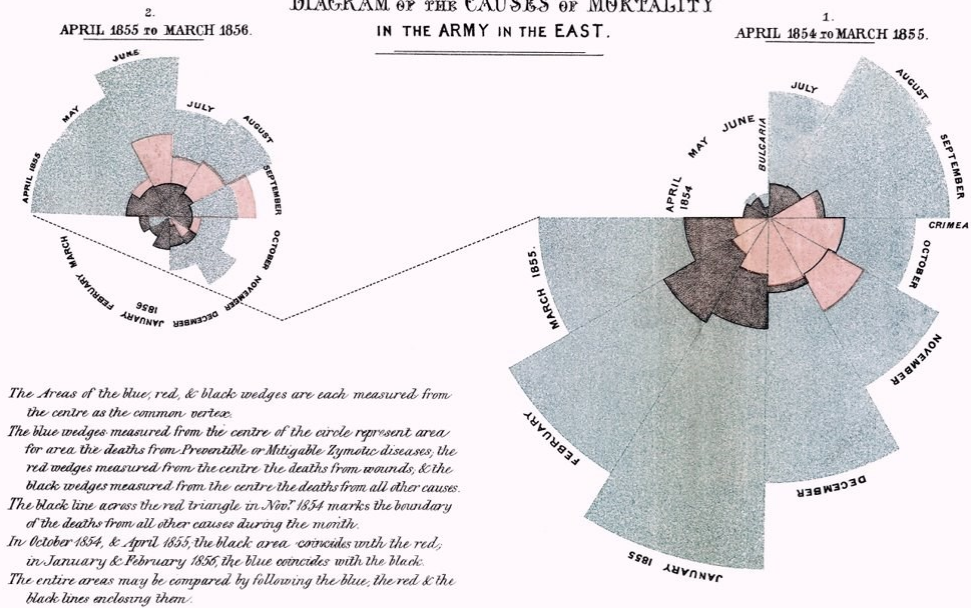
First woman member of the Royal Society Statisticians - wrote over 200 books on nursing, maths and social reform

Reduced mortality from 42% to 2% in Scutari during Crimean War

Lobbied for connection of houses to mains drainage - Public Health Act 1874/5

Pioneered Infographics

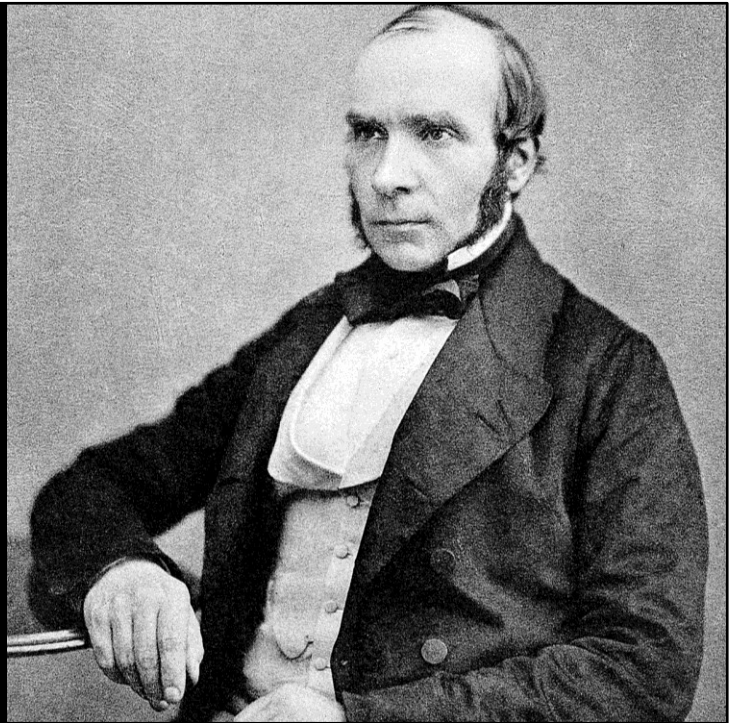
DIAGRAM OF THE CAUSES OF MORTALITY IN THE ARMY IN THE EAST.



Florence Nightingale(1820 – 1910)

John Snow (1813 – 1858)

Doctor, Surgeon, Statistician, Public Health
Campaigner



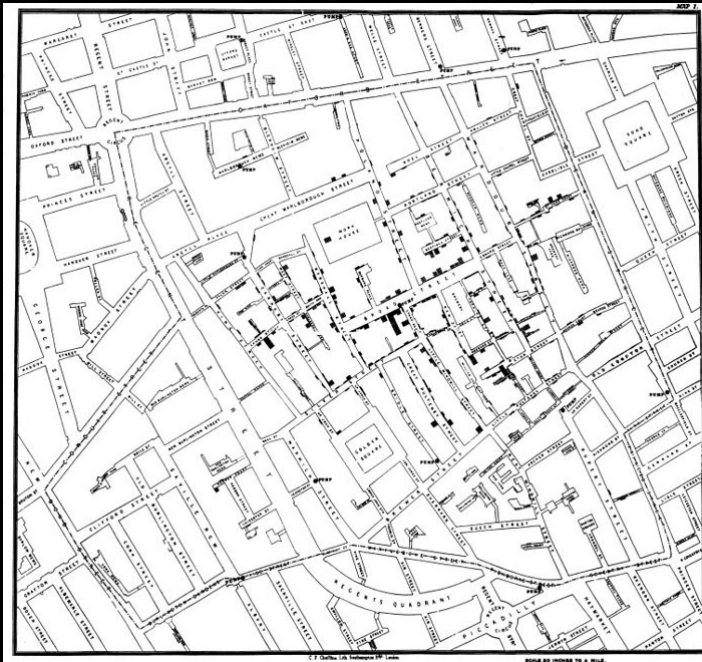
John Snow
(1813 – 1858)

Doctor, Surgeon, Statistician, Public Health Campaigner
Doctor & Surgeon

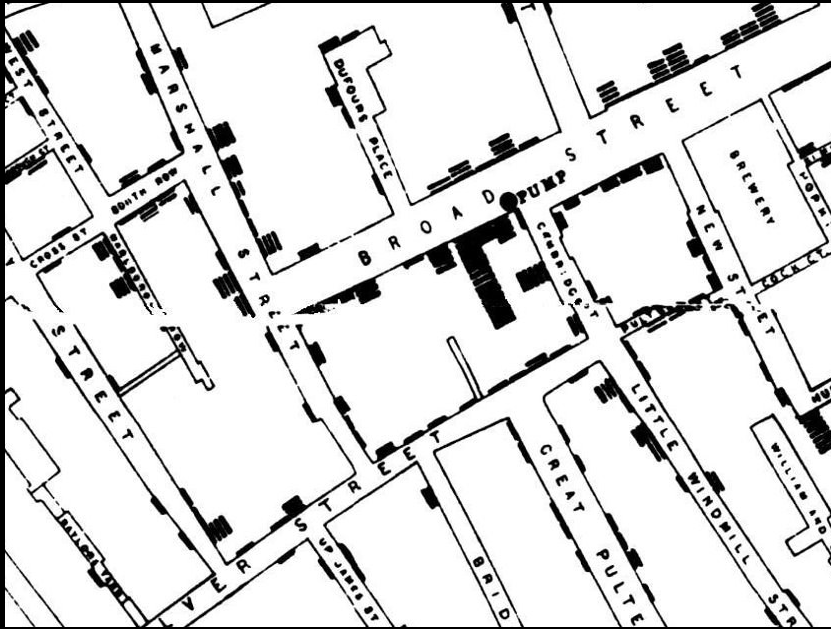
Pioneered obstetric anesthesia

Discredited the 'miasma' theory of disease

Employed statistics & graphical mapping to determine source of 1854 Cholera outbreak



John Snow (1813 – 1858)



John Snow (1813 – 1858)





The John Snow, Broadwick St

So, What Makes A Good Vis Good?

(Spoilers: It's subjective)

The common theme to all these early visualisations is to support a narrative and provoke action.

Each had a story to tell

But what made these effective? Let's unpack by starting with defining Data Visualisation

Data Visualisation

- An interdisciplinary field that deals with the graphic **representation** of **data** and **information**

Wikipedia

Data Visualisation

- Data visualization turns granular **data** into easily **understood**, **visually compelling** and useful business **information**

Microsoft powerbi.com

Data Visualisation

- The representation and presentation of data to facilitate understanding

Data Visualisation, Andy Kirk

Summary Keywords: representation, compelling, presentation, data, information, understanding, usefulness, utility

Why? Actionable insights.

Three Principles

- Good Data Visualisation is Trustworthy
- Good Data Visualisation is Accessible
- Good Data Visualisation is Elegant

Data Visualisation, Andy Kirk

Good Data Visualisation is Trustworthy

Trustworthiness

"Lies, damned lies, and statistics"

Trust is of primary importance

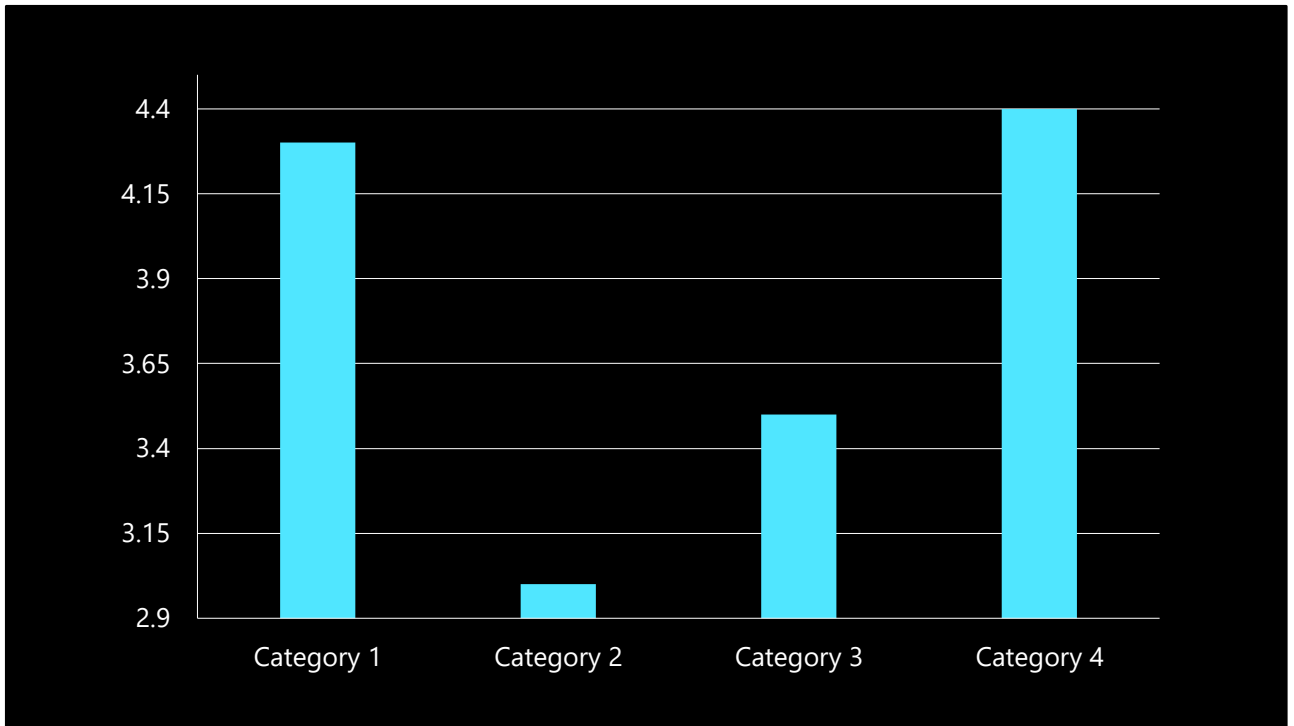
Without trust, **credibility** in the work diminishes leading to loss of **confidence** and unactioned **insights**.

Trustworthiness

- Truth vs Trust – **subjective** and **context** dependant
- Acknowledge **biases** – collection, preparation & presentation
- Eliminate **deceptive visual** practice
- **Cite** data sources, lineage, data freshness, owner

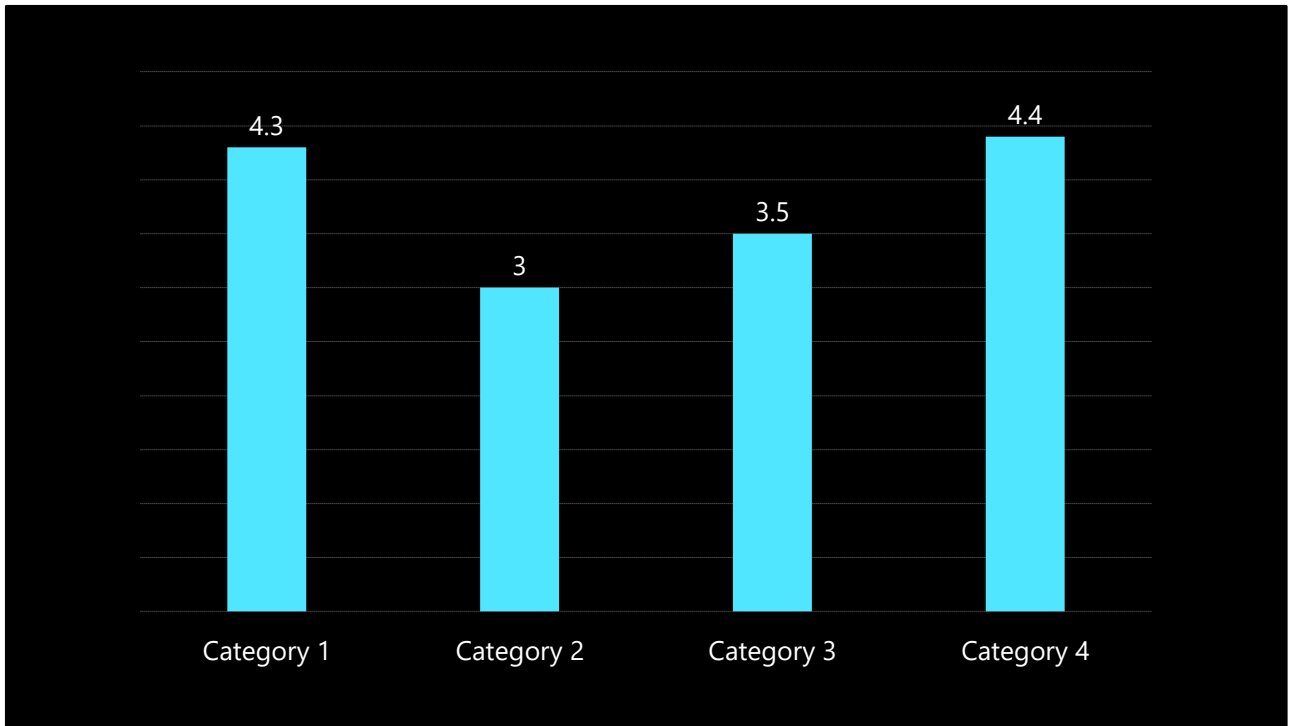
Truth / Trust. Truth is defined within a context – there can be multiple truths. For example, “single view of the customer”.

Bias exists in all processes.



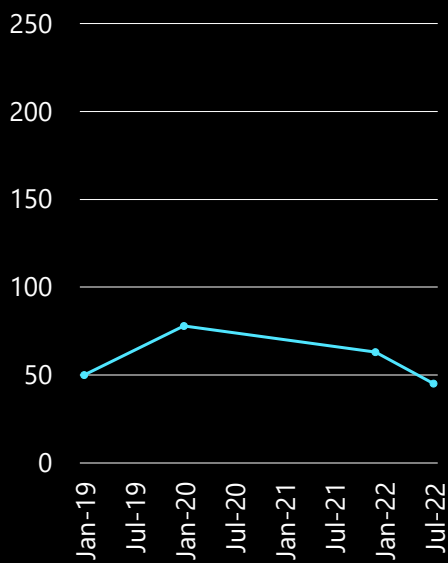
Omitting the zero baseline

Maybe data labels would be clearer than an axis / scale

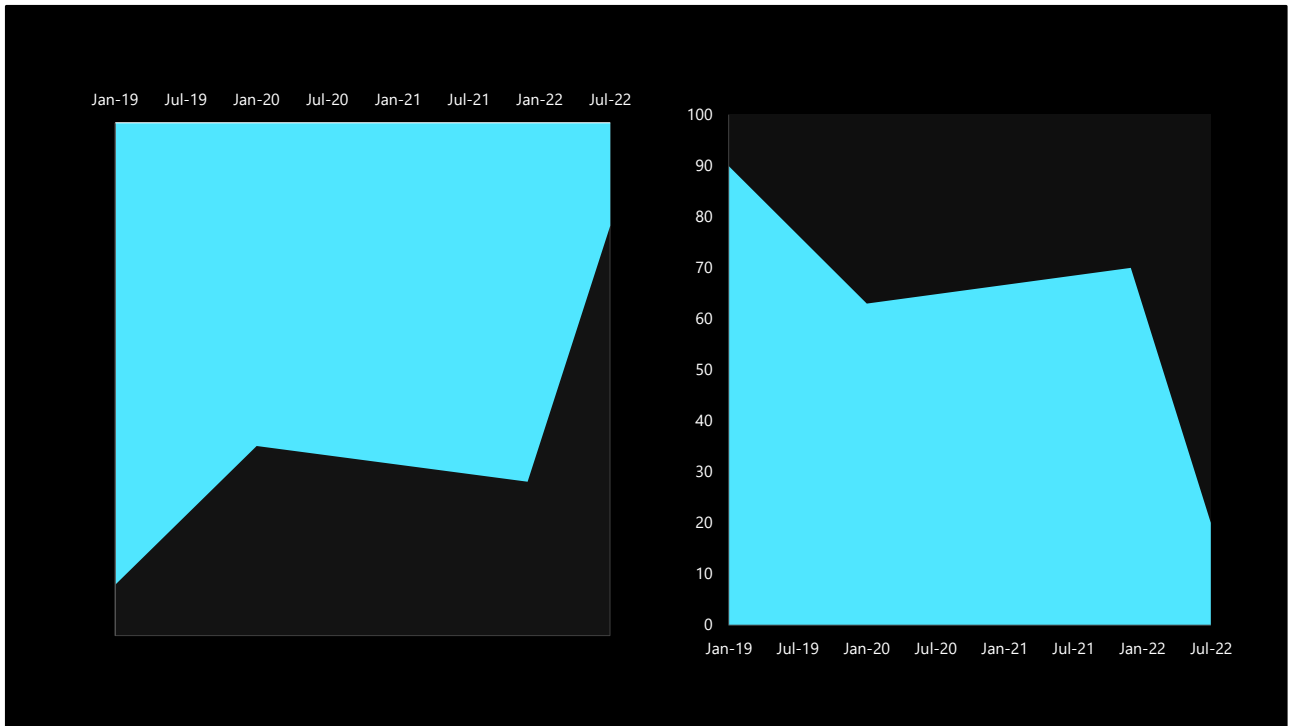


Omitting the zero baseline

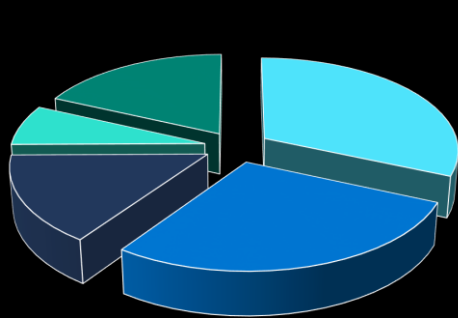
Maybe data labels would be clearer than an axis / scale



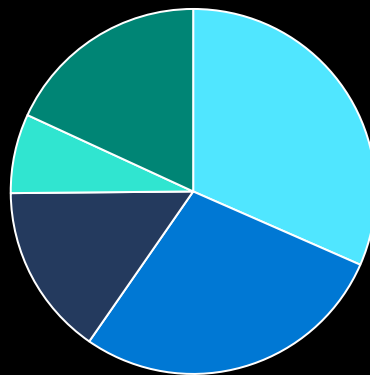
Compressing the Y Axis
Also, log scales,



Up and to the right – inverting the data, use of shading



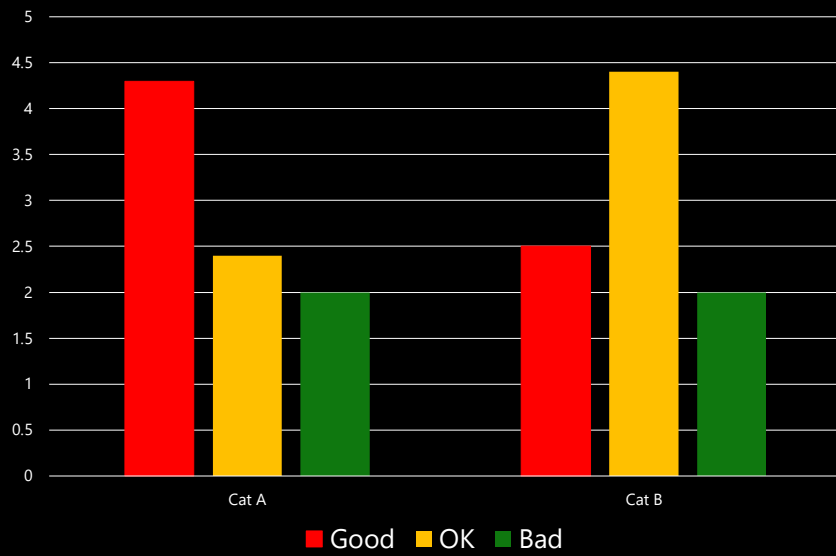
■ A ■ B ■ C ■ D ■ E



■ A ■ B ■ C ■ D ■ E

A (light blue) is largest.

Pie charts – parts to the whole not between parts – use a barchart



Abusing "standard" colours

Good Data Visualisation is Accessible

Accessibility

- Needs-based - who needs what and why
- Audience assumed knowledge
- Familiarity with representation
- Cognitive load – chart junk

Needs – what is the need for this data? Is it job related (and impacting on role), do they need all of the data?

Assumed knowledge – setting the expectation on level of simplification applied in mapping from a complex domain to a more simple

Familiarity – everyone knows how to read a bar chart, but what about an esoteric custom visual?

Cognitive load can decrease accessibility of your report (too hard basket) (vis vs infographic)

Chartjunk was first coined by Edward Tufte in 1983

All visual elements in [charts](#) and graphs that are not necessary to comprehend the information represented on the graph, or that distract the viewer from this information.

Good Data Visualisation is **Elegant**

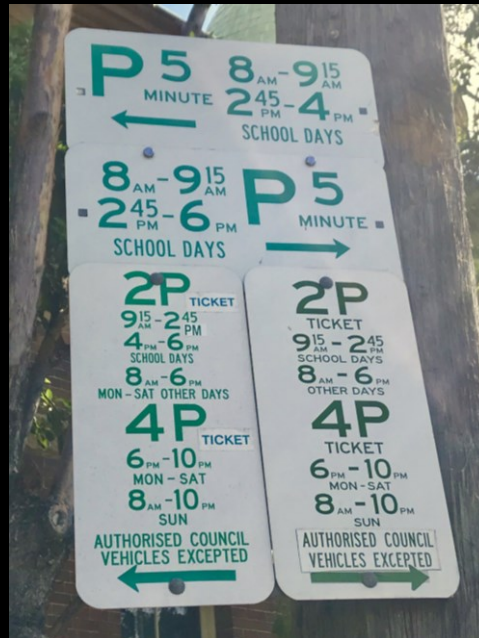
"Oh, that's beautiful, I want to know what this is about"

-Giorgia Lupi

<https://giorgialupi.com/>

Elegance is where aesthetics blend with substance delivering an experience that holds the audience beyond the initial interaction. It is the addition of beauty to the necessary and useful.

<https://giorgialupi.com/>



<https://www.abc.net.au/news/2019-03-21/quiz-sydney-confusing-parking-signs/10683014>

To Park or Not to Park?

Rethinking the parking sign

In 2014, I tested out a redesign of the ubiquitous but notoriously confusing parking sign. I went guerrilla by targeting innocent signs starting with the one outside my window.

I asked a simple question: Why couldn't parking signs be this simple? It resonated with people from all over until eventually finding its way into city government. Today, it's in nine cities around the world and helping drivers everyday (by as much as 60 percent!).

I'm Nikki Sylanteng, a girl who's gotten too many parking tickets and thought there must be a better way. This hilarious sign illustrates the problem perfectly.

[Go to project blog](#)

PARKING SCHEDULE			
	SUN	MON - FRI	SAT
7 AM	ANY	NO PARKING	NO PARKING
8 AM	ANY	NO PARKING	NO PARKING
8:30 AM	ANY	NO PARKING	NO PARKING
			NO PARKING
4 PM		NO PARKING	NO PARKING
7 PM	ANY	NO PARKING	NO PARKING
*	ANY	NO PARKING	NO PARKING

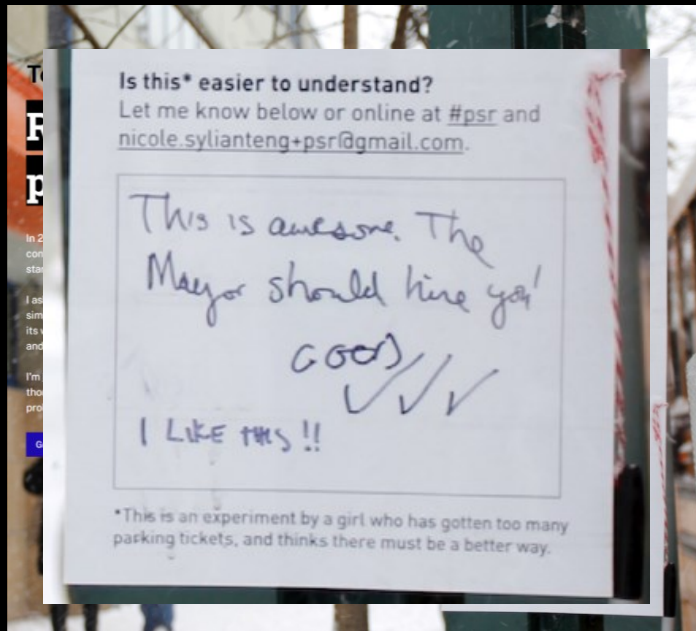
Is this* easier to understand?

Let me know below or online at @topark and nikkisylanteng@topark.com.


This is awesome. The Mayor should hire you! cool! ✓✓
I like this!!

*This is an experiment by a girl who has gotten too many parking tickets, and thinks there must be a better way.

<https://www.toparkornottopark.com/>



<https://www.toparkornottopark.com/>



Australian Government
 Bureau of Meteorology

HOME | ABOUT |

NSW VIC QLD WA S

[Bureau Home](#) > [Australia](#) > [Western Australia](#) > [Forecasts](#) > [Perth Forecast](#)

Perth Forecast

IDW12300
 Australian Government Bureau of Meteorology
 Western Australia

Perth Forecast
 Issued at 4:50 am WST on Friday 5 October 2012

Warning summary
 Nil.

Forecast for Friday
 Sunny. Light to moderate SE winds tending S'ly in the afternoon.

Precis:	Sunny.		
City:	Max 23		
Mandurah:	Max 21		

UV Alert: 8:50 am to 3:20 pm, UV Index predicted to reach 8 [Very High]
 Fire Danger: Coastal Plain: NOT RATED
 Hills: NOT RATED

Saturday	Sunny.	Min 10	Max 26
Sunday	Shower or two.	Min 12	Max 23
Monday	Partly cloudy.	Min 11	Max 24
Tuesday	Partly cloudy.	Min 11	Max 25
Wednesday	Sunny.	Min 11	Max 28
Thursday	Sunny.	Min 14	Max 33


The next routine forecast will be issued at 11:20 am WST Friday.

<http://web.archive.org/web/20121005014928/http://www.bom.gov.au/wa/forecasts/perth.shtml>

Assumed knowledge
 Cognitive load – reading numbers
 Trust? (It's a weather forecast after all)

Forecast issued at 4:40 am WST on Wednesday 10 April 2013.

Forecast for the rest of Wednesday



Max **34**

Partly cloudy.

Chance of any rain: **10%** ■■■■■■■■

Rainfall amount: **0 mm**

**Fire
Danger**

Perth Coastal Plain: Low-Moderate

Perth Hills: High

UV Alert from 9:30 am to 3:10 pm, UV Index predicted to reach 7 [High]

<http://web.archive.org/web/20130409205646/http://www.bom.gov.au/wa/forecasts/perth.shtml>

Added an Icon, highlight Max temp
Chance of rain 10%, possible showers.
But no rain (zero mm)?

Wednesday 6 July



Min 9 Max 19

Shower or two.

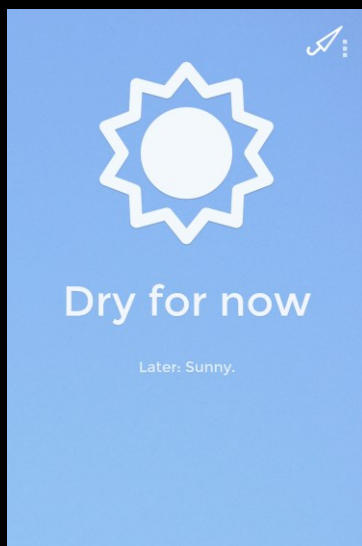
Possible rainfall: 0 to 3 mm

Chance of any rain: 50% ■■■■■■■■■■

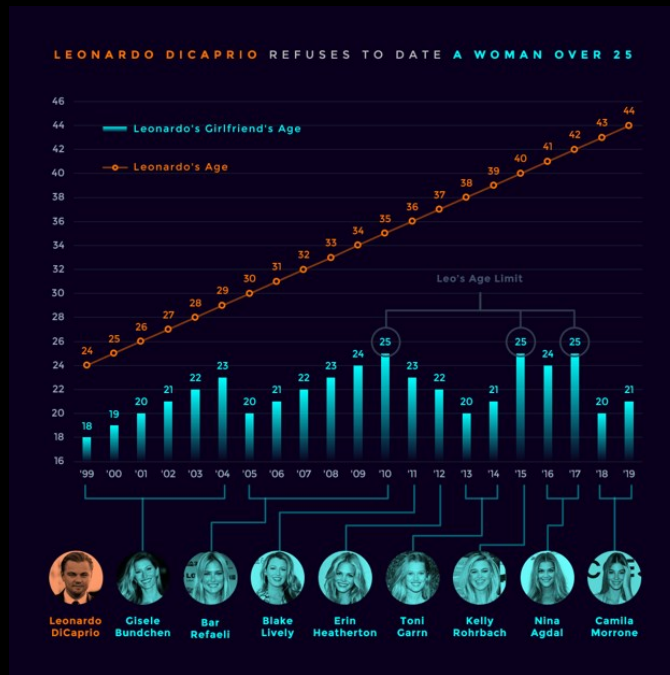
Perth area

Partly cloudy. Medium (50%) chance of showers, most likely during the morning. Light winds.

<http://www.bom.gov.au/wa/forecasts/perth.shtml>



Brolly – Google Play Store



https://www.reddit.com/r/dataisbeautiful/comments/azjt7/leonardo_dicaprio_refuses_to_date_a_woman_over_25/

Just because I like this one :D

The Room of Change — giorgialupi

<https://giorgialupi.com/the-room-of-change>

[Dear Data \(dear-data.com\)](https://www.dear-data.com)

<https://www.dear-data.com/theproject>

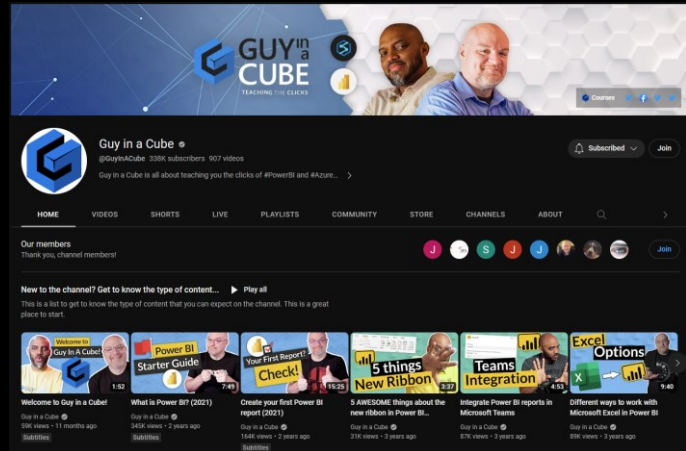
But How Do I Make It Good?

YouTube



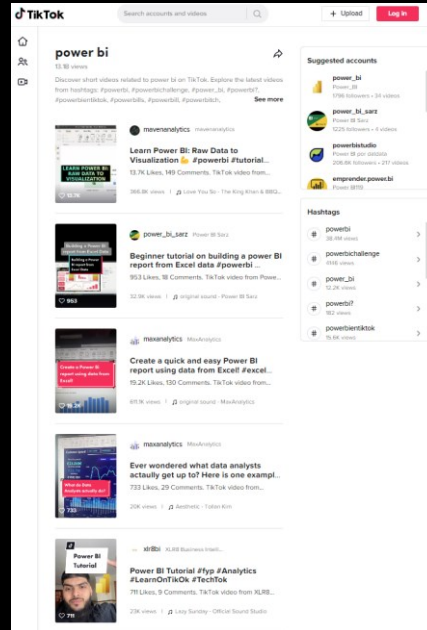
<https://www.youtube.com/howtopowerbi>

YouTube



<https://www.youtube.com/guyinacube>

tiktok



Financial Times Visual Vocabulary: Power BI Edition

Visual Vocabulary

There are so many ways to visualise data - how do we know which one to pick? Click on a category below to decide which data relationship is most important in your story, then look at the different types of charts within the category to form some initial ideas about what might work best. This list is not meant to be exhaustive, nor a wizard, but is a useful starting point for making informative and meaningful data visualisations.

Click any section below to view the charts

Deviation

Emphasise variations (+/-) from a fixed reference point. Typically the reference point is zero but it can also be a target or a long-term average. Can also be used to show sentiment (positive/neutral/negative).

Correlation

Show the relationship between two or more variables. Be mindful that, unless you tell them otherwise, many readers will assume the relationships you show them to be causal (i.e., one causes the other).

Ranking

Use where an item's position in an ordered list is more important than its absolute or relative value. Don't be afraid to highlight the points of interest.

Distribution

Show values in a dataset and how often they occur. The shape (or 'skew') of a distribution can be a memorable way of highlighting the lack of uniformity or equality in the data.

Change over Time

Show emphasis to changing trends. These can be short (intra-day) movements or extended series spanning decades or centuries. Choosing the correct time period is important to provide suitable context for the reader.

Part-to-Whole

Show how a single entity can be broken down into its component elements. If the reader's interest is solely in the size of the components, consider a magnitude-type chart instead.

Magnitude

Show size comparisons. These can be relative (just being able to see larger/smaller) or absolute (need to use fine differences). Usually these show a 'counted' number (for example, barrels, dollars or people) rather than a calculated rate or per cent.

Spatial

Used only when precise locations or geographical patterns in data are more important to the reader than anything else.

Flow

Show the reader volumes or intensity of movement between two or more states or conditions. These might be logical sequences or geographical locations.

CREATED BY

Andy Thomas (@andythomas)

INSPIRED BY

Andy Thomas (@andythomas) for the design / theme inspiration from @ft

FT Graphics team (https://www.ft.com/content/2018/12/12/visual-vocabulary-power-bi-edition) for the content / data

Visual Vocabulary Power BI Edition

CREDITS

Power BI Community & Tableau Community - for sharing their advice and support and knowledge

AND IN PARTICULAR

Andrew Thomas (@andythomas) - for sharing his insight regarding the power of Power BI

David Thomas (@dthomas) - for sharing his insight regarding the power of Power BI

Highland (@highland) - for sharing his insight regarding the power of Power BI

Robbie Wainwright (@robbywainwright) - for sharing his insight regarding the power of Power BI

CUSTOM VISUALS

Mapbox	Chartio	Tableau Chart by Author	Donut Plot by WMC
Python	Infographic Designer	Box & Whisker by WMC	Donut Chart by WMC
Conditio by WMC	Simple Pyramid by WMC	Matrix Chart	Sankey
Water Diagram by WMC	Matrix Chart	Circle Chart	Stack Chart
Stack Chart by WMC	Flow Map	Heat Map	Heat Map
Sankey	Chart	Network Diagram	Sankey Network Diagram

<http://sqljason.com/2018/12/financial-times-visual-vocabulary-power-bi-edition.html>

Power BI Visuals

Bring your data to life with stunning, interactive data visualizations tailored to your organization and industry.

[Learn more](#)

Power BI Visuals x Power Platform

All results

Chiclet Slicer

Microsoft Corporation

Power BI Visuals

Display image and/or text buttons that act as an interactive filter on other visuals

4.0 (24 ratings)

Free

[Get it now](#)

Text Filter

Microsoft Corporation

Power BI Visuals

Search across your dataset right from the dashboard

4.2 (154 ratings)

Free

[Get it now](#)

Timeline Slicer

Microsoft Corporation

Power BI Visuals

Graphical date range selector to use for filtering data

3.4 (228 ratings)

Free

[Get it now](#)

Word Cloud

Microsoft Corporation

Power BI Visuals

Creates a fun visual from frequent text in your data

4.2 (33 ratings)

Free

[Get it now](#)

Power KPI Matrix

Microsoft Corporation

Power BI Visuals

Monitor balanced scorecards and customized number of metrics and KPIs in a compact, easy to read list

3.7 (31 ratings)

Free

[Get it now](#)

Gantt

Microsoft Corporation

Power BI Visuals

A type of bar chart which illustrates a project timeline or schedule with resources

3.2 (51 ratings)

Free

[Get it now](#)

Advance Card

Sheneth India

Power BI Visuals

Advance card visual with more options than default card visual available in Power BI

4.2 (55 ratings)

Free

[Get it now](#)

Sunburst

Microsoft Corporation

Power BI Visuals

Multi-level sunburst chart for effectively visualizing hierarchical data

4.1 (55 ratings)

Free

[Get it now](#)

Histogram Chart

Microsoft Corporation

Power BI Visuals

Visualize the distribution of data over a continuous interval or certain time period

2.4 (82 ratings)

Free

[Get it now](#)

Radar Chart

Microsoft Corporation

Power BI Visuals

Multiple measures plotted over a categorical axis. Useful to compare attributes

3.6 (128 ratings)

Free

[Get it now](#)

Power KPI

Microsoft Corporation

Power BI Visuals

A powerful KPI indicator with multi-line chart and labels for current data value and reference

4.1 (103 ratings)

Free

[Get it now](#)

Infographic Designer

Microsoft Corporation

Power BI Visuals

Beauty your reports with easy-to-use infographics

4.2 (34 ratings)

Free

[Get it now](#)

Dial Gauge

Qualiflora Technologies

Power BI Visuals

Dial Gauge allows you to define various ranges in the dial along with pointer value

3.6 (79 ratings)

Tornado chart

Microsoft Corporation

Power BI Visuals

Comparing the relative importance of variables between two groups

3.3 (48 ratings)

Sankey Chart

Microsoft Corporation

Power BI Visuals

Flow diagram where the width of the arrows is proportional to the quantity of the flow

3.3 (120 ratings)

Play Axis (Dynamic Slicer)

Mansoft

Power BI Visuals

Working like a dynamic slicer, it animates your other power BI visuals without any user interaction

4.5 (42 ratings)

Box and Whisker chart by MAQ Software

MAQ LLC

Power BI Visuals

Understand the mean, median, and quartile distribution of your data

3.8 (33 ratings)

Ultimate KPI Card

Getronics India GmbH

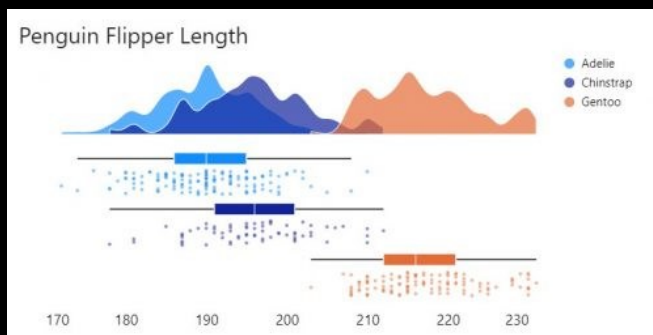
Power BI Visuals

Show a value, its variance to a reference value and its variance to 2nd or 3rd reference value

3.8 (33 ratings)

Deneb

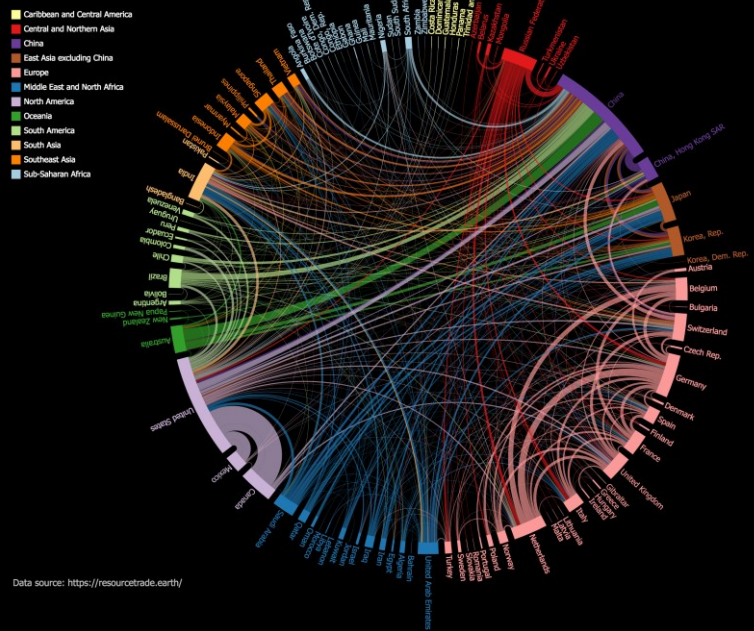
deneb-viz.github.io



<https://kerrykolosko.com/raincloud-plots-with-deneb/>

Charticulator
charticulator.com

Global Trade of Natural Resources in 2016



Honing Your Art

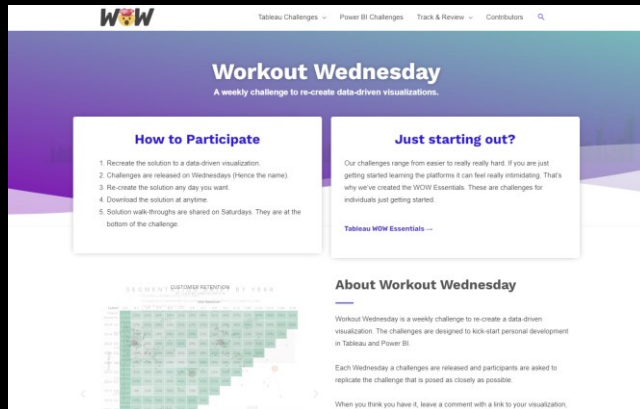
#MakeoverMonday

The screenshot shows the homepage of the MakeoverMonday website. At the top is a dark blue navigation bar with the MakeoverMonday logo and links for Home, The Book, Data Sets, Blog, Workshops, About Us, and Shop. The main content area features a large image of a book titled '#MakeoverMonday: Improving How We Visualize and Analyze Data' by WILEY. To the right of the book, the text reads: 'Improving How We Visualize and Analyze Data One Chart at a Time'. Below this, a paragraph states: 'Explore different perspectives and approaches to create more effective visualizations. #MakeoverMonday offers inspiration and a dose of perspective for those who communicate data.' At the bottom left, it says 'Welcome to Makeover Monday!'. At the bottom right, there is a small chart titled 'World's Cases in Dementia's Southern Provinces Are Decreasing' with a line graph and the number '457,815'.

The screenshot shows a Twitter thread. The top tweet is from Soyoung Park (@Soyoung82663955) posted 56m ago. The text says: 'With this week's #makeovermonday, I adopted a new idea, a circle chart starting from 0 axis, to deliver an insightful message. Here's my viz : public.tableau.com/profile/soyoung...'. Below the text is a visualization titled 'The Climate Change Is Not A Hoax' which shows two horizontal bar charts. The top chart is labeled 'Global' and the bottom chart is labeled 'Northern'. Both charts use a color gradient from green to red to represent temperature anomalies over time. The bottom tweet is from Blinle (@BlinleSabatola) posted 22h ago. The text says: 'This year I want to participate in #MakeoverMonday projects FAITHFULLY. I'll be updating this thread weekly. Enjoy!'. Below this is a tweet from Michal Kolář (@kolacek_m) posted 11m ago. The text says: 'Spiral of Global Warm(n)ing'. Below this is a tweet from Michal Kolář (@kolacek_m) posted 11m ago. The text says: 'My take on this week's #MakeoverMonday about temperature anomalies'.

<https://www.makeovermonday.co.uk/>

Workout Wednesday



The screenshot shows the 'Workout Wednesday' homepage. At the top, there's a navigation bar with links for 'Tableau Challenges', 'Power BI Challenges', 'Track & Review', and 'Contributors'. The main heading is 'Workout Wednesday' with the subtitle 'A weekly challenge to re-create data-driven visualizations.' Below this, there are two columns. The left column, titled 'How to Participate', lists five steps: 1. Recreate the solution to a data-driven visualization. 2. Challenges are released on Wednesdays (hence the name). 3. Re-create the solution any day you want. 4. Download the solution at anytime. 5. Solution walk-throughs are shared on Saturdays. They are at the bottom of the challenge. The right column, titled 'Just starting out?', explains that challenges range from easy to hard and mentions 'Tableau WOW Essentials'. Below these columns is a section titled 'About Workout Wednesday' which describes the weekly challenge and includes a link to 'Tableau WOW Essentials'.

Workout Wednesday

A weekly challenge to re-create data-driven visualizations.

How to Participate

1. Recreate the solution to a data-driven visualization.
2. Challenges are released on Wednesdays (hence the name).
3. Re-create the solution any day you want.
4. Download the solution at anytime.
5. Solution walk-throughs are shared on Saturdays. They are at the bottom of the challenge.

Just starting out?

Our challenges range from easier to really really hard. If you are just getting started learning the platform it can feel really intimidating. That's why we've created the WOW Essentials. These are challenges for individuals just getting started.

[Tableau WOW Essentials](#) ...

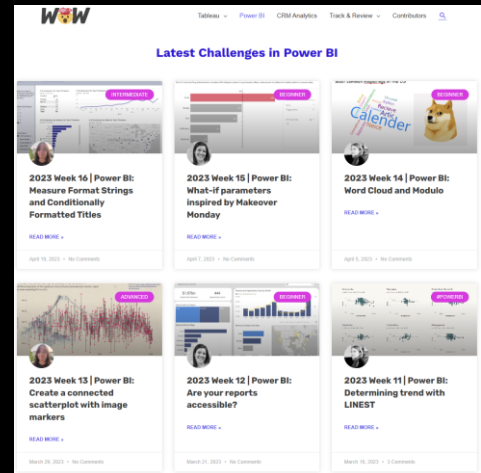
About Workout Wednesday

Workout Wednesday is a weekly challenge to re-create a data driven visualization. The challenges are designed to kick-start personal development in Tableau and Power BI.

Each Wednesday a challenge is released and participants are asked to replicate the challenge that is posted as closely as possible.

When you think you have it, leave a comment with a link to your visualization.

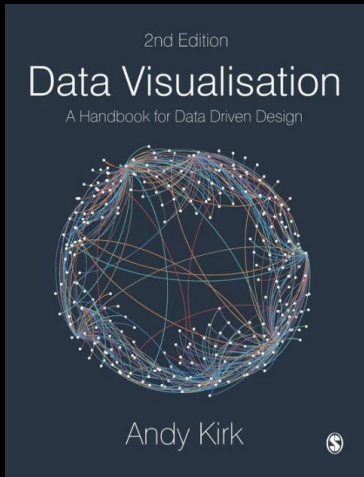
<https://www.workout-wednesday.com/>



The screenshot shows the 'Latest Challenges in Power BI' section. It features a grid of challenge cards. Each card includes a thumbnail image, a title, a brief description, and a 'READ MORE' link. The challenges are listed in chronological order from top to bottom.

Latest Challenges in Power BI

- 2023 Week 16 | Power BI: Measure Format Strings and Conditionally Formatted Titles**
April 19, 2023 • No Comments
- 2023 Week 15 | Power BI: What-if parameters Inspired by Makeover Monday**
April 7, 2023 • No Comments
- 2023 Week 14 | Power BI: Word Cloud and Module**
April 5, 2023 • No Comments
- 2023 Week 13 | Power BI: Create a connected scatterplot with image markers**
March 29, 2023 • No Comments
- 2023 Week 12 | Power BI: Are your reports accessible?**
March 27, 2023 • No Comments
- 2023 Week 11 | Power BI: Determining trend with LINEST**
March 16, 2023 • 3 Comments

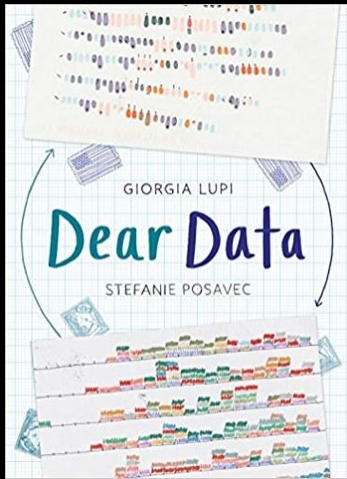


Data Visualisation: A Handbook for Data Driven Design

Andy Kirk

ISBN 9781526468925

<https://www.visualisingdata.com/book/>

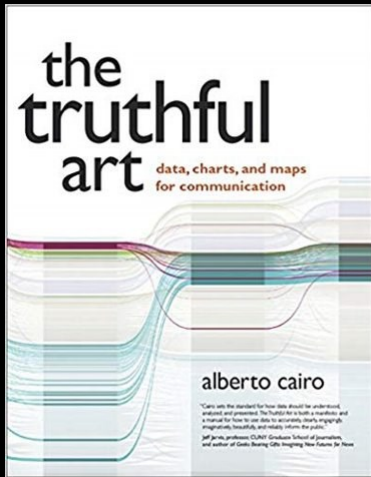


Dear Data

Giorgia Lupi, Stefanie Posavec

ISBN 9781846149061


<http://www.dear-data.com/>



The Truthful Art Alberto Cairo

ISBN 0321934075

TED Ideas worth spreading



GIORGIA LUPU

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How we can find ourselves in data

Read transcript

Giorgia Lupi uses data to tell human stories, adding nuance to numbers. In this charming talk, she shares how we can bring personality to data, visualizing even the mundane details of our daily lives and transforming the abstract and uncountable into something that can be seen, felt and directly reconnected to our lives.

[Giorgia Lupi: How we can find ourselves in data | TED Talk](https://www.ted.com/talks/giorgia_lupi_how_we_can_find_ourselves_in_data)

https://www.ted.com/talks/giorgia_lupi_how_we_can_find_ourselves_in_data

...data are always just a tool we use to represent reality.
They're always used as a placeholder for something else, but
they are never the real thing.

[...]

We somehow forgot that there were stories -- stories of
human beings behind these numbers.

Giorgia Lupi



Thank You

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