

Hi, I'm David McCandless, founder of Information is Beautiful.
Love pie. Hate pie-charts. AMAs are beautiful.

mccandelish¹ and r/Science AMAs¹

¹Affiliation not available

April 17, 2023

Abstract

Hiya. I'm David McCandless, a London-based author, writer, designer and founder of Information is Beautiful (Facebook / Twitter). I'm interested in how visualized information & data can help us understand the world, and reveal the hidden connections, patterns & stories beneath the surface. Edit (12:00 ET): I'm back, chomping through these great questions. Keep asking. Edit (12:21 ET): Nice (inevitable) discussion on pie charts already: https://www.reddit.com/r/dataisbeautiful/comments/3ol03x/hi-im_david_mccandless_founder_of_information_is/cvy3emu Edit (12:37 ET): Getting stuck into Excel now too... https://www.reddit.com/r/dataisbeautiful/comments/3ol03x/hi-im_david_mccandless_founder_of_information_is/cvy3eq3 **edit (13:50 ET): Taking a break - back in 10 or so. Back and on it. edit (15:12 ET) I'm done. My brain is cooked! What amazing and insightful questions. Thank you all very much for a great experience. I'll try to pop back later and answer some more questions. I've been a big lurker on Reddit for years but maybe now I will come out a bit more. At least to polish off some of the fights below... My main passion is visualizing data & information about anything I don't fully understand, such as Snake Oil? Evidence for Nutritional Supplements, A Million Lines of Code, or How Many Gigatons of CO2 Will it Take to End the World?. The more stupified or confused by a subject I am, the better the resulting viz, I've found. I particularly love applying a visualization / design lens to unusual subject matter. Like The Left vs Right Political Spectrum, Psychological Defenses, Rhetological Fallacies or The Best Data Dog. Before design, I freelanced for outlets like The Guardian and Wired. Before that, I was a video games reviewer and Doom champion (I have eerie gaming skills). And yes, it's true. I made The Helicopter Game. These days, I've been playing with software, developing a platform called VizSweet to generate static & interactive data-visualisations. Examples: World's Biggest Data Breaches, The Internet of Things or every key relationship in the Middle East. I've recently started teaching too so happy to answer questions on What Makes a Good Visualization?. I see visualization as a new language, culture and form of expression. I'm very excited about its future. I'm a longterm Reddit lurker - so very honoured to be here. Here's proof that it's me. I'll be back at noon ET to answer all your questions. In the meantime, Ask Me Anything.

[REDDIT](#)

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MCCANDELISH [R/SCIENCE](#)

ABSTRACT

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I see visualization as a new language, culture and form of expression. I'm very excited about its future.

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CORRESPONDENCE:

DATE RECEIVED:
October 14, 2015

DOI:
10.15200/winn.144474.42831

ARCHIVED:

How much time goes into "looking for new interesting data sets" vs. "cleaning the data" vs. "writing code/visualising the data" vs. "doing the write up"?

(and are there any other important steps that I've missed?)

[frostickle](#)

It's usually around 80% data, 20% visual & design

Typically might break down like this (% overall time taken)

October 13, 2015

CITATION:
mccandelish , r/Science , Hi,
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pie. Hate pie-charts. AMAs are
beautiful., *The Winnower*
2:e144474.42831 , 2015 , DOI:
[10.15200/winn.144474.42831](https://doi.org/10.15200/winn.144474.42831)

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: Have an idea, shape it (2%) : Research data and sources (10%) : Clean, arrange and understand data (10%) : Realise data is opening up new questions, research those (20%) : Realise data is contradicting original assumption, correct those and reform (20%) : Shape final data into story (15%) : Fact-check (3%) : Create a visual moodboard (2%) : Sketch 2-3 possible visual routes (3%) : Starting design (one route usually comes out on top) 10% : Style, artwork and polish (3%) : Fact-check and release (2%)

The design / visualisation bit goes very quickly if you've really, deeply understood the data, the idea, why you're doing it and the story that emerges from the data.

You really don't design data when you visualise. You design your *understanding* of the data.

Dave 'Fab Macca' McCandless, you're a reason why I went into IT. Evenings way past my bedtime spent typing in Speccy code from *Program Pitstop*, often a wall of hex with one frikkin error in it, under the threat of the electricity meter running out minutes before finishing, were a staple of part of my childhood. I couldn't believe my eyes when I saw you resurfacing in a Ted talk of all things! Thank you, you glorious bastard.

Two questions:

- 1) Seriously. How is T'zer pronounced, and are you still in touch with any of the YS mob?**
- 2) Are there any Speccy games that you still return to on occasion, that you think still stand up against modern games in terms of playability?**

Cheers!

[redditorriot](#)

Ah Fab Macca. Not been called that for many moons...

1) Tee-zer 2) Yes I still have a stab at Manic Miner from time to time which is just a perfect and joyous piece of homegrown game design.

I remember asking Nate Silver about using excel as a visualization tool and he seemed to be a big fan. What do you think? Other than that, what are your favorite visualization tools?

As someone who often has to turn things around using excel for work, I took his advice to heart and have made my excel visualizations look better over time, so I'd love to hear your opinion.

I just moved to London, any plans for talks in here any time soon that I can turn up at and listen to your wisdom?

Thx!

[SlySpyder13](#)

Yeah I like Excel and have used it for years - much to my family's chagrin (I use spreadsheets for **everything**). I like its swiftness and use it as a sketch pad to quickly do plots etc.

I've been playing with RAW lately (a nice easy web frontend for D3) and Plot.ly looks good for scientific stuff. There's a big hunger for tools and I hope to release one myself.

I do occasional workshops in London if you want to hang out? I can't link to them directly here but you can search around to find them.

Thanks for the question!

Hi David! I've loved your work and deeply appreciate the attention you pay both to the design and the quality of data for the visualization.

I'd like to know what your thoughts are on the place of data visualization in academia. I had once pondered a career in it, but felt that a lot of the information, especially the most important findings, never really reach the public where it could do a lot of good (case in point, a lot of current research in psychology, my field). What can we do as practitioners to create that bridge?

[SereneScientist](#)

Thank you! I think dataviz is a lens that can be turned onto any subject - the more complex, esoteric, densely academic the better, in a way - as those scientific areas often have important insights and knowledge locked away behind jargon and complexity, inaccessible to the public or even other scientists from other fields. Done well, dataviz can act as a portal, or a looking glass, so anyone can peer in and understand or, at least start to understand, the depths of a subject.

I'd say if you're an expert practitioner of psychology or any other complex field, then you're the bridge. Start visualising your understanding of the field. You don't have to be a designer. You can just sketch, create diagrams etc of what you know and want to communicate and see where it leads.

I'm tired of my job. It pays well, but it's genuinely killing my soul. I've thought about getting into data science, but I have very little experience with Python, SQL, etc, etc. I had significant experience working with stats in grad school, but that was years ago. What advice can you offer to those people who want to learn to visualize data creatively and turn it into a career?

[jackedsquatt](#)

Definitely sharpen up those statistics data science skills. I'd also say work on your information skills - that is journalism: story-telling, writing & communication, asking questions, developing concepts, and learning a refined sense of what is interesting. If you can analyse data and then tell a compelling, interesting story about what you've found, WIN.

Can you remember a time where the use of statistics dramatically changed your opinion on something? A scenario where the stats disproved many of your preconceived notions about a topic?

[rhiever](#)

I've noticed that researching and visualising stats & data has substantially reduced my anxieties around [air travel](#), [infectious diseases](#), and [sunscreens](#).

Working as a journalist, made me deep consumer of the media - which really does cause [inflammation and increases anxiety IMHO](#).

Sadly, the only topic where the stats haven't reduced my anxiety is climate change.

Hi David, Thanks for spending time for this AMA and congratulation on your awesome work.

Looking at your work, I feel that there are still various degrees of investment that a reader must put in in order to read and digest the information. This is a function of the complexity of the information, the strategy selected for the visualization, and the interest of the reader.

My question is, when you show your work to someone, do you still get comments on how hard it is to decypher the message you are trying to convey? and how do you know when it's on you (the work) or on them (for whatever reason, too familiar or not familiar enough with the subject, are not invested, difference aesthetic sensitivity...)?

[whatevs](#)

That's an interesting question thank you. I don't receive that much feedback around legibility or decypherability. But maybe those people just mutter to themselves and click away? Can you cite a piece that you think is particularly tricky?

Are you still blaming your poor performance in that US Doom championship on lag?

[massive trousers](#)

Don't get me started...

How do you decided to be a visualization designer? Is there any particular statistical graph that help you with that decision ?

[unchandosohi](#)

I worked for twenty years as a writer & print journalist and gradually, as I worked more and more online, designed more and more websites, played more and more video games, my thinking and imagining and understanding became increasingly visual. Then it felt more natural - and exciting - and effective to visualise the results of my research, rather than encode it into writing. So, gradually, explicable, I morphed into this new beast: a designer-writer. A visualization-designer? A graphist?

I still see myself as a journalist. I see a lot of similarities between information design and journalism. Both set about to condense and optimise information into tight, understandable, elegant form, telling stories and helping others to navigate.

Do you love donuts, and hate donut charts too?

[comical_imbalance](#)

Hmmmm, I'm not that fond of donuts actually. But I actually don't mind donut charts so much. (see above for reasons why)

Have you ever experimented with non-visual representations of data such as sonification? The sonification of the sorting algorithms was a good example of interesting sonification.

<https://youtu.be/kPRA0W1kECg>

[robclouth](#)

Hah nice. Not experimented with sonification, but really enjoy and savour things like [Listen to Wikipedia](#).

Thank you for doing this AMA. You are an influential figure in the world of data visualization and I appreciate you taking the time to answer our questions.

I feel that many popular designers (yourself included) tend to emphasize the visuals at the expense of the story behind the data. I believe it's possible to do both, and I believe that constructive criticism and open dialog is a great way to do so (re: arctic ice viz example below). I am going to throw out some challenging questions which I hope [/r/dataisbeautiful](#) (and you) do not take as an insult against your character. I'm legitimately attempting to understand the world of data visualization better and there are few who are better to engage in this conversation than someone with your influence.

1. How do you respond to criticisms that you create and promote [chartjunk](#)?
2. Do you feel the [trifecta checkup](#) is a valid form of data visualization appraisal? Why or why

not?

3. How do you judge whether or not a data visualization is bad/good/great? Note that many of your charts (specifically [this one](#)) fail to meet more than one point of the "trifecta checklist", so I'll understand if you don't have a favorable view of it or view it as valid. Is it clicks, retweets, shares? Or is there an internal, aesthetic, well-defined rubric that you use?
4. Related to (1) - should "poor design, by design" be encouraged? Specifically consider [this](#) data visualization of arctic ice which is very popular and gets lots of attention, but does not immediately answer many relevant and important questions about the data very well (or at all). It is "beautiful", but doesn't tell a story in any obvious way. Now consider some of the critiques and revisions [here](#). Be sure to check out the links in the comments, which yields [this](#) elegant chart from [this NASA article](#).)

Again, I genuinely appreciate you for taking the time to come here and answer our questions, I look forward to your replies.

[a contact juggler](#)

Thanks for this. I appreciate your candour.

How do you respond to criticisms that you create and promote chartjunk?

I think this term is too broadly applied and stems from a misunderstanding of the various reasons for creating a visualisation. Firstly, using colour, usual or inventive forms, illustrative motifs, interesting type doesn't automatically make something chartjunk - especially if the goal is to engage or get attention or simply be creative with the form. Those are legitimate aims.

But if your goal is to communicate quickly and efficiently to harried executives or business leaders or for your printer to use less ink, then of course, colour, extraneous graphics - or even style - are secondary to your intention and can be, probably should be, discarded.

In a rich and varied developing field such as dataviz, there's plenty of room for many different intentions, many different audiences, many different goals and lots of experimentation. Some experimental or creative output will be chartjunk and criticised. Just like some canonical or classic output will be boring and ignored.

Do you feel the trifecta checklist[3] is a valid form of data visualization appraisal? Why or why not? **How do you judge whether or not a data visualization is bad/good/great?

I'm not familiar with trifecta checklist but it looks interesting and useful. I usually consider elements from both the design and content sides. Things like.

Strength of idea / proposition / question, Information & data quality, usefulness, revelation, effectiveness of execution, ease of use, aesthetic beauty, originality, style, creative touch, originality.

re: NASA chart Is a lovely example of how passionate feedback and communities can improve an end result. The "chartjunk" stimulated the effort and generated a much better clarified version now for everyone to clearly understand. Maybe that's one of the roles 'chartjunk' can play? A kind of reverse inspiration?

Hi Dave,

Thanks for taking the time to share your thinking with the masses.

I get the sense that something is lost when compared with traditional data visualisations. A type of "new" visualisations—these interactive systems like the friends and enemies in the middle east—simply trivialise the complexities of the problem. For example where the real

structure in the data is not reflected in that of the visualisation, but that folk consuming the visualisation derive insight from the visualisation structure: the faux proximity between actors in the middle east for example.

How do you rationalise the inclusion of this (to steal from Tufte) "chart junk" in the form of animations, interactivity, placement, and layers, when the core message of the data may be lost?

In your AMA brief you say "*main passion is visualizing data & information about anything I don't fully understand*"; but what if the visualisation infers structure, relationship, or causality that is not more than an artefact of the visualisation layout algorithm or effect?

[olmec-akeru](#)

Thanks for this thoughtful question.

It's always an uneasy thought applying dataviz to highly serious subject matter, be it gun deaths or the conflicts of the Middle East.

In the case of the [Middle East interactive](#), the complexity of the situation is the theme - visually and informationally. The opening state (the thicket of inter-relations) is meant as a visual reminder of this - that this region defies simple solutions. That said, the viz goes on, here are some of the reasons why certain entities love and hate each other. So at least you can begin to have a working knowledge and context of what is a woefully reported subject area.

(BTW the entities in that graphic are plotted geographically. Proximity is not labelled as a meaningful attribute. The focus is clearly on the relationships, emphasized by them springing into being on spawn).

"Chartjunk" I'll address below. People are a little trigger-happy with that term IMHO.

What language would you recommend for creating interactive visualisations? I am competent with R for analysis, vector and raster graphics for static visualisations and infographics, but like a kiddie in a sweet shop with all of the choices available for interaction. Thanks.

[Crypt0Nihilist](#)

I think the gold standards are currently R, Processing and Mike Bostock's [D3](#).

I have a list of libraries, languages and front ends I've been meaning to investigate. Here it is: Seaborn, BlockSpring, Superconductor, Variance, Chart.js, ZingChart, dimple, VIDA, Shiny. Let me know how you get on!

What is the most beautiful data visualization you've come across? Do you have any aesthetically pleasing favorites?

What about the most compelling?

[zonination](#)

That's a good question as I think beauty can mean different things depending on what domains you're considering,

"Information is Beautiful" is a nod towards the beauty of really good visualisation - not just physical aesthetic beauty (traditional notion) but also the beauty of clarity, the beautiful structure and integrity of great data, the beauty of a great story or insight, and the beauty of using or interacting with a really great piece of design - functional beauty.

In terms of aesthetic beauty, I really like the work of [Akkurat](#), [Stefanie Posavec](#) and [Nicolas Felton](#).

Hi David, much thanks for doing this AMA! Near the end of *Knowledge is Beautiful*, you leave us with a tantalizing graphic that suggests that data visualizations are just the beginning and that knowledge mapping and inter-connected knowledge may be a destination. Do knowledge visualizations exist, and if so, what are your favorites?

[tungs](#)

Hiya - glad you read the book. Yes I think knowledge-maps exist. The website visual-complexity.org archives many. I'll try to dig up some of my favourites and post them here.

When you begin to analyze a new set of data, are you driven by some underlying result that you're wishing to see or do you just play around with the set until something interesting comes up?

[DaBooba](#)

Mix. I usually have a concept, idea or question in my mind when I open up a dataset - or an assumption of what it might contain. A lot of the time, the data contradicts this and leads me in a different direction. That's the fun part!

Sometimes the data is boring. Nothing is happen. So yeah, I play around with the set, bring in other data to normalise or compare, or ask deeper questions until it starts to get interesting.

Hi there. What tools do you use for your visualisations, and roughly how much time do you spend using each? e.g. 50% Python, 30% CSS etc.

[NeoShady](#)

Hiya. I use Excel / spreadsheets a lot - like 80% of the process. Then I shape visualisations by hand in Adobe Illustrator or I quickly plot with a tool like RAW, Excel, VizSweet and then tidy in Illustrator. The visual part is usually about 20%.

Is there anything you've always wanted to visualise but can't, e.g. because it's just too complex to be possible at the moment?

[EuphemiaChoosesLife](#)

Yep I have a load of these, archived in a spreadsheet (naturally). For my last book *Knowledge is Beautiful* I worked on 450 ideas and only 150 or so made it into the book - mostly for reasons of hubris. Some at random:

- World's Biggest Networks (Botnets vs Clouds- data very hard to find)
- Who invented what? (A historical map of **every** invention)
- The Mafia's Carbon Footprint (we actually worked it out)
- Hollywood Power Map (too complex)

The hardest part I find is making a visualisation that is easily readable by sports people. What books would you recommend to help me better learn how people understand information?

[sheikhbarabas](#)

I think the Edward Tufte books are essential. I also enjoyed quite an old book called *Elsewhere: Mapping that detailed all kinds of theory and information maps*. *Why Maps Work* by Alan M MacEachern is another classic (I'm just reading down my book shelf now...). The work of academic Alberto Cairo is also worth following.

Where do you take inspiration from for your visual work? How long can you take working on perfecting it? I think i remember before that you did a complete revamp on one of your visuals on ISB

[subzero1988](#)

Yeah I'm always revising my work - much to the annoyance of my co-workers. I don't really see any image as "finished", especially with so much data evolving.

I have a big collection of about 3000+ data-visualisations and designs on my hard-disk that acts as a giant moodboard. When I'm looking for inspiration, I just dip my head into that folder and pull out pieces that excite me around form, colour, typography, style. They form a moodboard that usually informs the visual I then work on. I'm always adding to the folder, looking at new work, collecting images etc

A question about your Excel 2016 ad: how much do you really use Excel for visualization? Since the first visualization is in Excel, how many will you create outside Excel? Name two (known) persons you feel close to (viz-wise) and two persons you feel a little less close. Is there a line between data vis and data art? Where will you draw it? Scenario: You are a CEO of a large corporation. You know its datavis practices suck. What are you planning to do to improve them?

[wisevis](#)

how much do you really use Excel for visualization?

Quite a lot. It's my starting point usually, especially for large, multi-sheet monsters.

Since the first visualization is in Excel, how many will you create outside Excel?

I usually explore 2-3 visual routes after doing some quick plots to see how the data, metrics, ranges all balance out.

Name two (known) persons you feel close to (viz-wise) and two persons you feel a little less close.

Not sure. There's such a wild variety of style and focus in this area. If you can suggest some people, go for it.

Is there a line between data vis and data art?

yes, I visualised the distinction as I see it [here](#).

Scenario: You are a CEO of a large corporation. You know its datavis practices suck. What are you planning to do to improve them?

Is this you?? I'd start doing hackathons and cross-departmental creative workshops to find where your (potentially unsung) talent might be. Dataviz requires a combination of skills: story, analysis, design, concepting, research, code. It's rarely found in one person. Building teams is usually the answer.

Who else works in this Space that you are a fan of? Emil Johanson at LOTRproject does some good work on the Tolkien universe.

[ianmalcm](#)

Ah so many. See the line up of the recent [Visualized conference](#) for a good list.

My main passion is visualizing data & information about anything I don't fully understand

Isn't that one of the biggest risks in data visualisation: incorrectly visualizing data because the nature of the data is unknown to the 'artist' making the infographics? Even on this subreddit incorrect graphs and other visualizations are often voted all the way to the front page before someone makes a remark about the mistakes in the images. By this time, they're found all over the internet.

How do you prevent this from happening?

[Laloeka](#)

Well, I start from a place of not fully understanding and then my journey (and challenge) is to research and inquire, assemble and verify, until I have a deeper and more comprehensive understanding of the topic. It's useful sometimes to come from an more "ignorant", naive perspective as then you ask the simple, obvious questions that can be assumed by a technical audience with prior knowledge. That way, the graphic you shape hopefully covers all the bases and gives a fair, reliable and rounded view of a given topic - rounded by trying to smooth out ignorance wherever it pops up. The net result is that it may speak to as a broad an audience as possible. This process, I think, is popularly called journalism or data-journalism in this case.

Hey David, big fan. Do you have nightmares about 3D conical graphs?

That aside, I find it really difficult to hire in this area. First class visualisation designers are a rare breed. Any tips?

[magicbullets](#)

All the skills required for good dataviz - story-telling, analysis, research, design, style, number-crunching - are rarely found in one person. Two person or three/four member teams are usually the solution. You probably have them already in your organisations, like sleeper agents, just waiting for the right hackathon or open workshop to activate them.

I visit Snake Oil Supplements every few months. Today I notice it has changed dramatically, with fewer items above the Worth It line. What happened?

[belugascale](#)

We revised the data and pulled in a load of new Cochrane meta-studies - most of which trashed the efficacy of many supplements.

The public data is [here](#): The viz is [here](#).

What is your favorite kind of pie?

[piedeity](#)

Really old-fashioned 3D apple pie.

Ironically, I am having a really hard time understanding where you were going with the visualization on this article: [What Makes a Good Visualization?](#)

Can you help me understand what this is supposed to represent?

[Trek7553](#)

Sure! These are the four elements I think are necessary for a successful visualisation. If you combine 2 or 3 of the elements, you get different types of outputs: scripts, templates, rough sketches, storyboards. If you combine all four, you get a visualization. Hope that helps!

Hi David,

Your TED talk and book (Information is Beautiful) sparked my interest in data visualisation and I've been trying to learn how to make them myself. So far I've done [a choropleth map of the Indonesian elections](#) and [a Voronoi map of football clubs](#).

I've recently gotten my master's degree in development studies and would love to learn more about data visualisation and apply that in the development sector. I'm currently trying to build a portfolio to get a job or internship at an NGO. Do you have any suggestions in terms of skills I should learn, topics I should look into, or perhaps things I should avoid? Of course any other suggestions are more than welcome.

[qpolask](#)

These are lovely pieces. As I mentioned above, skills in journalism - story-telling, communication, inquiry - are a great asset in data visualisation and might single you out.

(opinion) A big problem in data storytelling is manipulating data purely to prove your point. I would say this pattern is something like :: idea > data > parse to prove idea > print Often this pattern can cause storytellers to ignore data and create inaccurate or incomplete views. With the power data holds, patterns like this are frustrating and unfortunate. Do you have any signs or patterns that you point to to say, "This is the wrong direction", or "That conclusion is unfair", or similar statements that help ensure fairness and strength in your conclusions? Or possibly any opinions on my opinion overall?

[timaronan](#)

Yes this is a common experience in my process. Often I start out with an idea which has an agenda, conscious or unconscious. Then as I start to examine the data and the reality, my idea start to feel the "gravity of the truth" and start to bend in a different direction. It's my decision, at that point, as an author / creator to either go with the momentum or stick to my point. There have been several cases where I've had to confront my own biases to bring an image to fruition. Personally I like the cognitive workout. It's a bit of a journalistic conceit that you can be purely objective. Others, I guess, may choose to go to the "dark side". The team of talented people I work with keep me in check.

Do you fear that beautiful data viz can be used for evil, as well as good? How can we balance the concern of keeping methods transparent with the desire to simplify things for popular audiences?

[chaosmosis](#)

Good big question. I guess all things get used for evil eventually. You can lie with statistics and you can really lie with visualized statistics. Both the considerable power of numbers and the power of design combined. Hard to argue with. My guard would be transparency of data and of process and of methodology. We share [all our datasets](#) for every image released. About 25% of visitors look at the sheets. There's also a strong vocal community who, when they're not turning their barrels on me, are quick to attack and police "bad charts" released by political powers. Think The Chart Police help too.

I have copies of both your books, well had. I've lent one out to a friend who's decided to not return it.

Absolutely love them and still find myself paging through them every once in a while and learning yet another new thing.

I'd just like to offer a personal thanks for making learning so fun. It's encouraged even the less

curious of my friends to broaden their horizons.

[UnknownWon](#)

You're very welcome!