

Top Tips

Data Visualisation



Data Visualisation

The representation and presentation of data to facilitate understanding

According to Colin Ware in “Visual Thinking by Design” the average human attention span is only 8 seconds, and our brain processes visual images 60,000 times faster than text.

It's a common mistake to think that charts are just a fancy way of showing numbers. They're not. They're tools for understanding

Robert Kosara

The primary goal of data visualisation is to communicate information clearly and efficiently. It makes complex data more accessible, understandable and useable.

Try to view visualisation as an important part of your analytical process. If you have spent hours assembling, cleaning and analysing your data, all your hard work might be impacted upon if how you present your findings isn't thought through.

How to make a good data visualisation

It is very important that when you are turning data into a visualisation that you consider your end user/consumer/customer.

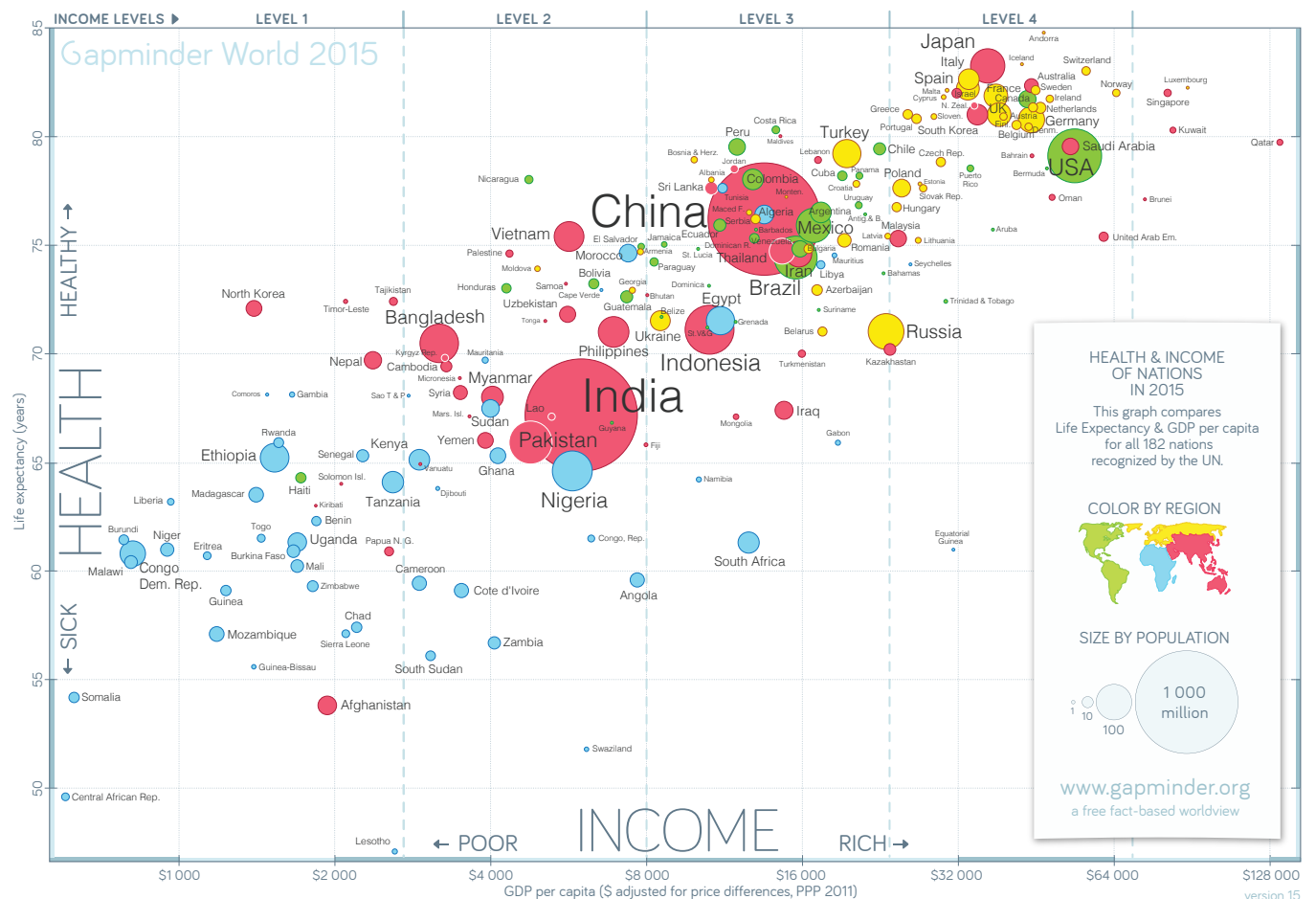
Find out how your end user(s) like to consume data:

- Do they want to be able to see the underlying data?
- How much time are they going to be able to spend on a visualisation? Will they just be glancing at it, or is it something that they will be looking at in depth?

If it's the former then you need to make sure that your visualisation gives them everything they need without them having to work to understand it.

For example, below is the Gapminder World chart, made famous by Hans Rosling (you can download it from <https://www.gapminder.org/downloads/updated-gapminder-world-poster-2015/>).

This chart has a lot going on – it shows the health, income, size and region of every country in the world, all on one chart. This is not a chart for a quick takeaway message, this is a chart to be explored and looked at in depth, as it contains many interesting stories – look at the outliers for example, not just by location on the chart but by size and region.



What will help the consumer understand what the information is telling?

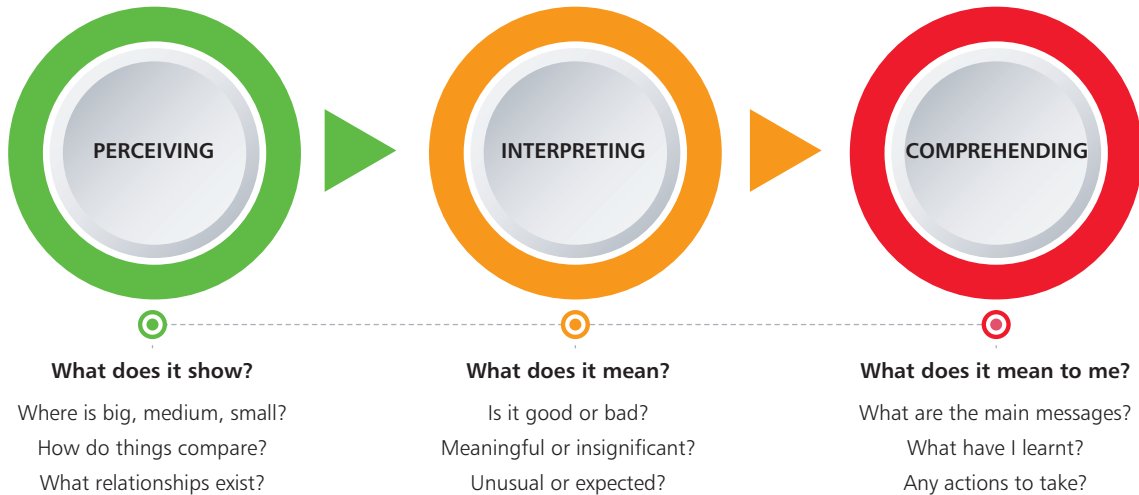
- Are you using the right charts to get the required messages across?
- Will it be on their computer and therefore can be interactive?
- Does it need to be printed out for a meeting?

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Steps for facilitating understanding through data visualisation

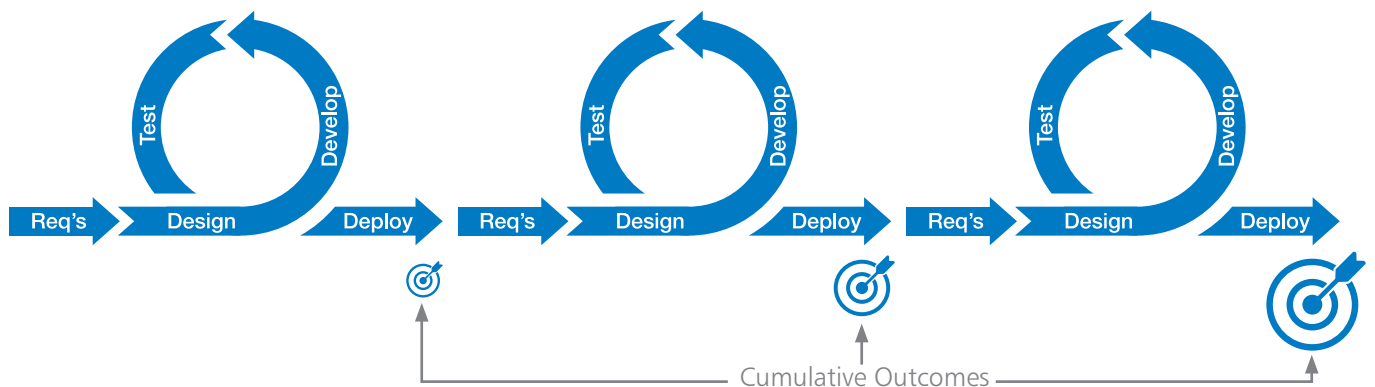
When consuming a visualisation, the viewer will go through a process of understanding involving three stages. Each stage is dependent on the previous one and in your role as a data visualiser you will have influence but not full control over these.



Collaboration with the consumer is key!

Working closely with the consumers of your data visualisation is essential. It is very difficult to develop something first time that will deliver exactly what is needed. Using elements of the Agile Project Management technique is really useful in the development of your data visualisation/dashboard.

Agile is a software development methodology where you collect your requirements from your consumer, develop something, test it out with consumer, deploy it but keep making iterations along the way until it is delivering what the consumers need to aid understanding and decision making; rather than taking the requirements away, building something, deploying it and that's it. Working closely with the consumer and developing something iteratively will ensure that the product produced will add value.



For more info about agile
www.crmsearch.com/agile-versus-waterfall-crm.php

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TOP TIPS

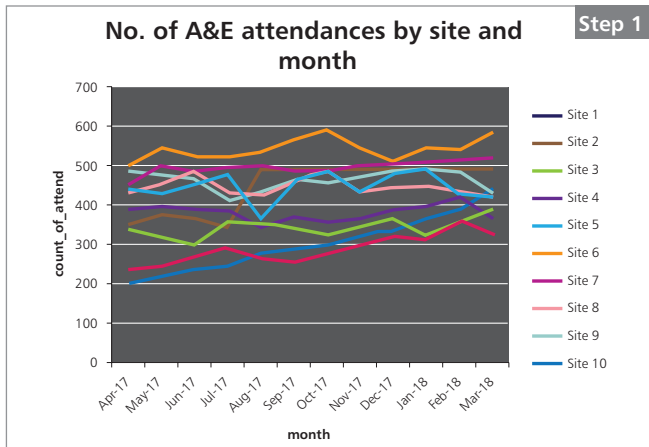
Top tips for creating an effective data visualisation

- **Keep it simple!** – choose the simplest way to convey the information
- **Choose the right chart** – make sure to choose the right sort of chart for the message
- **Remove distraction** – white space is ok!
- **Consider colours** – Colour is a great tool when used well. When used poorly, it cannot just distract but misdirect the viewer. Use it wisely in your data visualisation design
- **Order** – sort so the important message is really obvious/clear
- **Use comparisons** – to add context
- **Label/annotation** – give as much information as you can to help describe the overall message (but don't over clutter!)

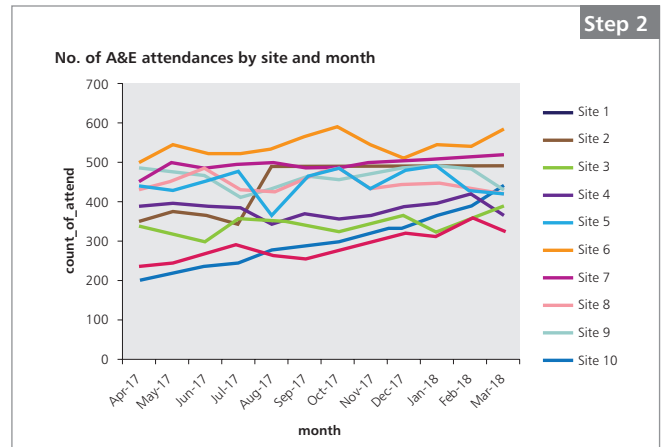


Data Visualisation

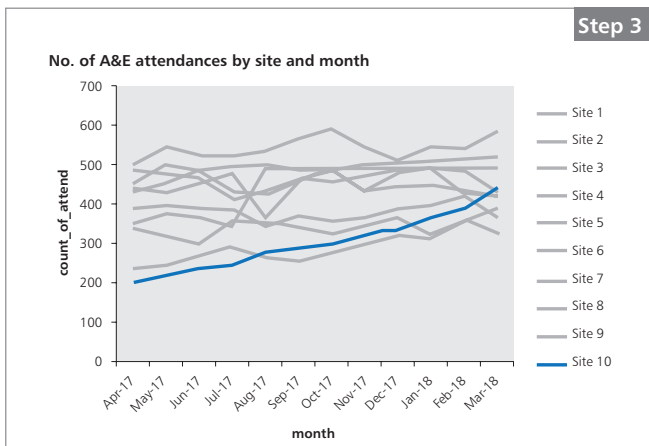
Chart Makeover



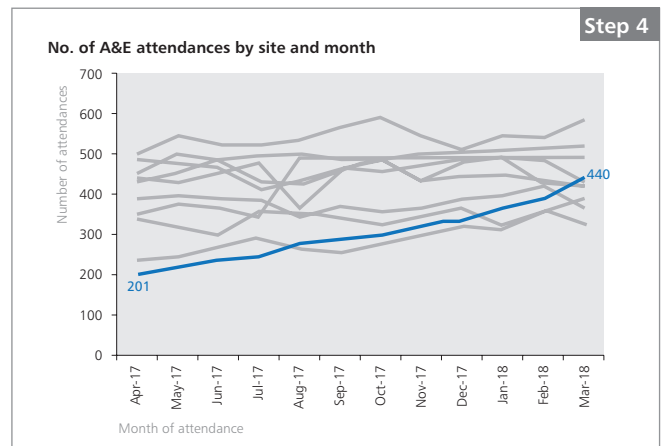
Spaghetti chart alert! Lots of lines, it's hard to make out anything interesting. The data is not the star of the show here - all the things around the chart get more space, such as the legend.



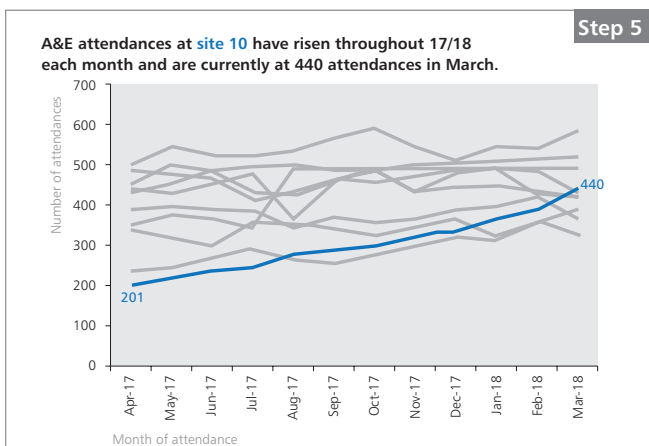
Let's get rid of that very dark background, plus the gridlines as we've already got enough lines in this chart! We've shrunk the title to give the chart more space too.



Let's try and find our story – there is too much going on in that chart to identify something interesting, but if we grey out all the other sites and just highlight site 10, look at that trend! (if you are using visualisation software, then you could add a hover over action for the other lines to show the site name etc.)



Now, we have tidied up the labels, removed the legend and given the chart a bit more space again. Now let's have a look at that title, is it helping to tell our story?



This title is a bit more descriptive and uses colour to link to the actual line that we are trying to highlight. Compare this version to the first one – which one do you think would let someone who has received your chart quickly spot a trend?

STEP 6 - Critical Reflection

Critical reflection is a really important last step in ensuring that your data visualisation does the job it is intended for.

What would you do differently with the chart above?

Think about how you might display some of the other interesting trends in the data, and how you would communicate that to your report recipient.

Think about the take away message in the title – remember that what you put here can influence the message that a consumer receives, for example "Site 10 has been consistently over capacity since August 17" is more of a call to action and implies that the trend is "bad". Whilst - "The newest site, site 10, opened in April 17, activity has risen steadily throughout the year and is now at expected levels" - is a positive message.

Chart Maker Directories – understanding which charts to use for what situation/representation

There is a great resource on Andy Kirk's website that breaks down the different types of charts available. It explains what each chart should be used for and which tool out there is capable of building each chart:

<http://chartmaker.visualisingdata.com>

Another great website which provides you with a catalogue of charts and explains exactly what they should be used for:

<https://datavizcatalogue.com/index.html>

Tools available for data visualisation

The current leading software for data visualisation:

Tableau – data visualisation tool created by Tableau Software. Helps you see and understand data. Connect to almost any database, drag and drop to create visualisations, and share with a click

www.tableau.com

Microsoft Power BI – suite of business analytics tools that deliver insight throughout your organisation. Connect to hundreds of data sources, simplify data prep, and drive ad hoc analysis.

<https://powerbi.microsoft.com/en-us>

Qlik (Qlik View/Qlik Sense) – a business intelligence data discovery product for creating guided analytic applications and dashboards tailor-made for business challenges

www.qlik.com/en-gb

D3 (Data-driven documents) - D3.js is a JavaScript library for manipulating documents based on data. D3 helps you bring data to life using HTML, SVG, and CSS. D3's emphasis on web standards gives you the full capabilities of modern browsers without tying yourself to a proprietary framework, combining powerful visualisation components and a data-driven approach to DOM manipulation.

<https://d3js.org>

Data Wrapper – is a user friendly, open-source web tool that you can use to create basic interactive charts. Built by journalists and used by journalists, but can be used by anyone!

www.datawrapper.de

Excel – data visualisation is not its primary function (or specialism unlike the above systems) but it is capable of developing some of the more basic charts available.

Useful resources:



Books

The books below are tried and tested favourites in a range of styles but all focussed on how to visualise your data effectively.

- The Big Book of Dashboards by Steve Wexler, Jeffrey Shaffer and Andy Cotgreave
- Data Visualisation: Handbook for Data Driven Design by Andy Kirk
- Information Dashboard Design: Displaying Data for at-a-Glance Monitoring by Stephen Few
- The WSJ guide to Information Graphics by Dona M.Wong
- The Truthful Art by Alberto Cairo
- The Back of the Napkin by Dan Roam
- Presenting Data Effectively by Stephanie D.H. Evergreen
- Good Charts by Scott Berinato
- Storytelling with Data by Cole Nussbaumer Knaflic

Websites



A number of websites that are really useful for understanding the power of good data visualisation and getting ideas about what works well:

www.visualisingdata.com

<https://informationisbeautiful.net>

www.perceptualedge.com/blog

<https://public.tableau.com/en-us/s/gallery>

Twitter



Twitter is a fantastic resource for data visualisation, for both inspiration and for technical guidance and assistance. Here are some accounts to follow to start with, also try **#DataViz** for ideas.

@storywithdata

@ECONdailycharts

@SimonBeaumont04

@WindsCogley

@theneilrichards

@nancyduarte

@CharlieHTableau

@sxywu

@TriMyData

@catmule

@cheeky_chappie

@VizWizBI

@kurtstat

@NadiehBremer

@infobeautyaward

@nytgraphics

@ChrisLuv

Critical reflection is a really important last step in ensuring that your data visualisation does the job it is intended for

The NHS Skills Development Network operates across NHS organisations in England. Its remit is to provide the infrastructure for improving leadership and professional development skills, raising standards and sharing best practice through economy-wide learning.

The Skills Development Network uses a dedicated website, www.skillsdevelopmentnetwork.com, to publicise and support its work. The website is the primary source of information for all staff in providing resources for personal and organisational development.

Skills Development activities include but are not limited to:

- Professional Education and Qualifications
- Lifelong Learning and Continuing Professional Development
- Talent Management
- Career Development
- Widening and Improving Technical Skills
- Achieving Excellence
- Partnership working
- Sharing Best Practice
- Networking
- Accreditation

Other Top Tips available include:

- Stress Management
- Communicating Financial Information Effectively
- Team Building
- Relationship Building
- Influencing
- Increasing Productivity
- Dealing with Change
- Negotiation in Healthcare
- Managing Personal Resilience

For more information visit www.skillsdevelopmentnetwork.com

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