# Introduction to....
# Data Visualisation

Institute of Development Studies

IDS Knowledge Services

August 2013

**Data visualisation is not a new topic – since the line graph and bar chart were invented in 1786[1] people have used graphical representations to explain large amounts of data, identify trends and tell stories. We live in an age where we generate enormous amounts of data. Data visualisation is a way of making sense of this.**

Researchers are good at crunching and analysing large amounts of data. While technical analysis provides necessary rigour, outputs can sometimes be complicated and full of technical language and are therefore only relevant to and understood by experts. By visualising the data, these complications can be broken down.

Data visualisation can be used to reach a wider audience, to persuade or influence, and to mobilise stakeholders for action. It is a, clear and efficient method of interpreting large amounts of data to convey new insights to others and to enable collaboration and interaction.

## Uses of Data visualisation

The purpose of a data visualisation, in a very broad sense, can be split into two uses: to explain and to explore. For example, it can be used to explain in terms of answering key questions, contextualising data and presenting arguments. In terms of exploration it can be used as a tool for analysis, finding patterns and discovering questions, amongst other things[2].

## Stages of visualisation development

**1. Define your purpose and formulate questions**

- What stories are you trying to tell? -The audience and purpose of the visualisation should always be top of mind when considering what you want to visualise
- What questions are you trying to answer?
- What is your overall strategy for change?

What is your desired outcome?

**2. Prepare and explore data**

- Tidy and clean the data to make any visualisation produced as clear as possible
- Discover patterns and find trends
- Work out what information to focus on and what to exclude.

**3. Develop designs and construct visualisation**

- Simplify and clarify the visualisation to make conclusions visible
- Understand the format of your visualisation and its strengths and limitations.
- Consider graphical features such as position, size, shape, and colour

**4. Launch and evaluate**

- Find where your issue has most impact
- Engage with target audience in the spaces where they exist

Measure success against strategy for change and desired outcome.

## How is visualisation relevant for Think Tanks?

There are many organisations that are looking to influence and inform, but often their audiences are time poor and have competing demands on their attention. How do you make your message heard in this noisy and complicated environment?

Data visualisation can provide an engaging method of expressing your message that is digestible and memorable.

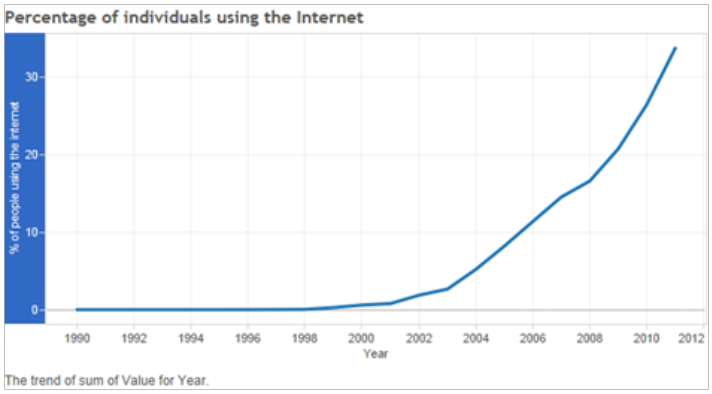
[1] http://en.wikipedia.org/wiki/William_Playfair

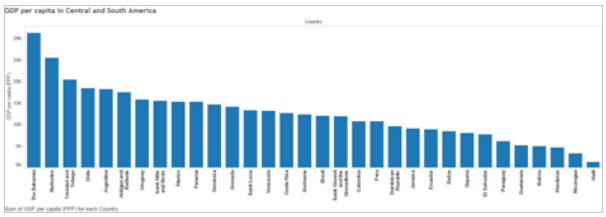
[2] Taken from from A. Kirk, Introduction to data visualisation training workshop, Brighton (November 2011)

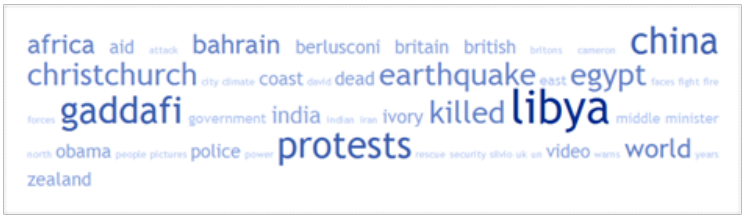
## Types of data visualisation

There are many types of visualisation and it is crucial to identify the appropriate type for the dataset. Here are some common types of visualisation.

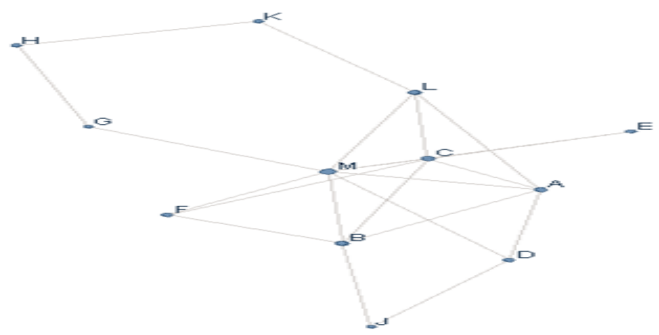
| Visualisation type | Examples | |
|---|---|---|
| **Time series**<br>For documenting sets of values over time | Line chart, fan chart, horizon graph | |
| **Comparative**<br>For communicating the comparison of values or sets of values | Bar charts, pie charts | |
| **Textual**<br>For communicating the frequency and/or importance of words or phrases in a body of text | Word clouds | |
| **Geographic**<br>For documenting geographic data | Maps, cartograms, chloropleth maps | |
| **Network and hierarchies**<br>For communicating relationships and hierarchical data | Force-directed layout, arc diagrams, matrix view, tree maps, and node-link diagrams, | |


Percentage of individuals using the Internet
% of people using the internet
30
20
10
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year
The trend of sum of Value for Year.


GDP per capita in Central and South America


africa
aid
attack
bahrain
berlusconi
britain
british
britons
cameron
china
christchurch
city
climate
coast
david
dead
earthquake
east
egypt
faces
fight
fire
forces
gaddafi
government
india
indian
iran
ivory
killed
libya
middle
minister
north
obama
people
pictures
police
power
protests
rescue
security
silvio
uk
un
video
wants
world
years
zealand


GDP per capita in Central and South America
GDP per capita (PPP)
1,300
31,300
About Tableau maps: www.tableausoftware.com/mapdata


K
H
L
G
E
C
M
A
F
B
D
J

# Introduction to....Data Visualization

### Top tips for good visualisations:

1. Decide on the message you want to convey...and convey it simply.
2. Use colour, size and prominence to help the reader understand the data and the message.
3. Avoid inconsistency (use a simple colour palette, maximise data to ink ratio, consistency of data representation (don't switch from cylinder graphs to bar charts))
4. Use colours sparingly, and double check the colours used are visible for the colour blind
5. Avoid 3D perspective (human eye gives more prominence to the section closest to the viewer, thus distorting the data)
6. Use text effectively (titles that mean something, explanatory labelling of and close to data – use to reinforce the message)

Data Visualisation guidelines - See more at: http://schoolofdata.org/2013/04/26/data-visualisation-guidelines-by-gregor-aisch-international-journalism-festival/#sthash.0LzvlAkj.dpuf

### Useful links

**Tactical Tech – Drawing by numbers**
A website packed full of advice, tools and inspiration for visualising data, specifically aimed at advocates and activists
http://drawingbynumbers.org

**Visualizing Information for Advocacy**
A manual aimed at helping NGOs and advocates strengthen their campaigns and projects through communicating vital information with greater impact
www.opensocietyfoundations.org/reports/visualizing-information-advocacy-introduction-information-design

**Visualising Data**
Lively blog and excellent lists of resources, including Important Tools for Visualising and Communicating Data and open data sources
www.visualisingdata.com/

**Visual.ly**
interesting and inspiring showcase of data visualisations and infographics
http://visual.ly

**IDRC 10 Data Visualisation Tips**, 22 May 2012, www.idrc.ca/EN/Documents/Quick-tips-English-22-May-2012.pdf

### Key IDS contacts

Simon Colmer, s.colmer@ids.ac.uk

**IDS Knowledge Services in partnership with Practical Action**

Institute of Development Studies, Brighton BN1 9RE UK
**T** +44 (0) 1273 606261
**F** + 44 (0) 1273 621202
**E** ids@ids.ac.uk **W** www.ids.ac.uk

Prepared for the IDRC-funded Think Tank Initiative Policy Engagement and Communications Program